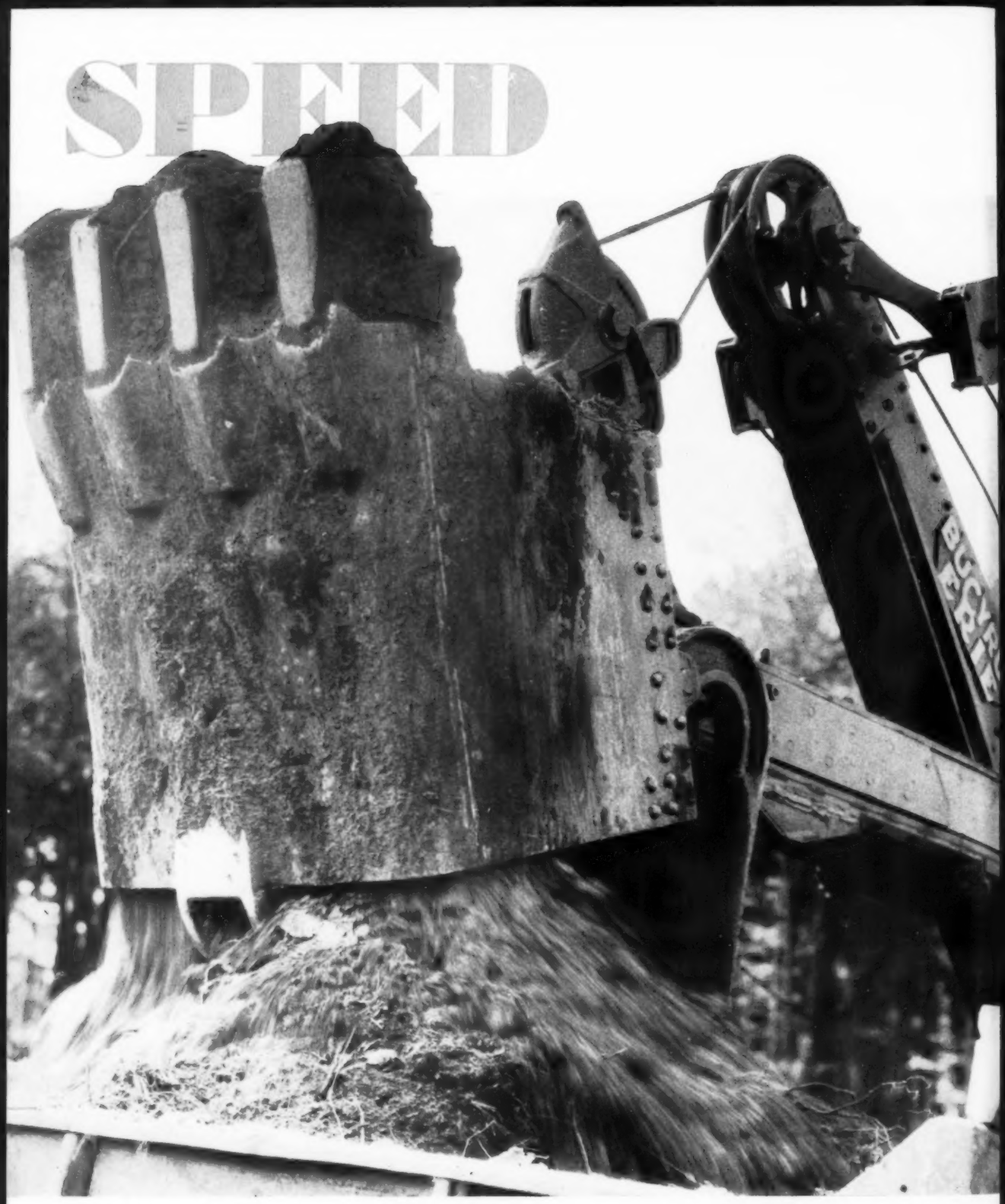
Vol. XXVI JANUARY 1932 No. 1

Bind over for index

THE EXCAVATING ENGINEER

FOUNDED 1905

Building a Highway Through the French Alps. See Page 29



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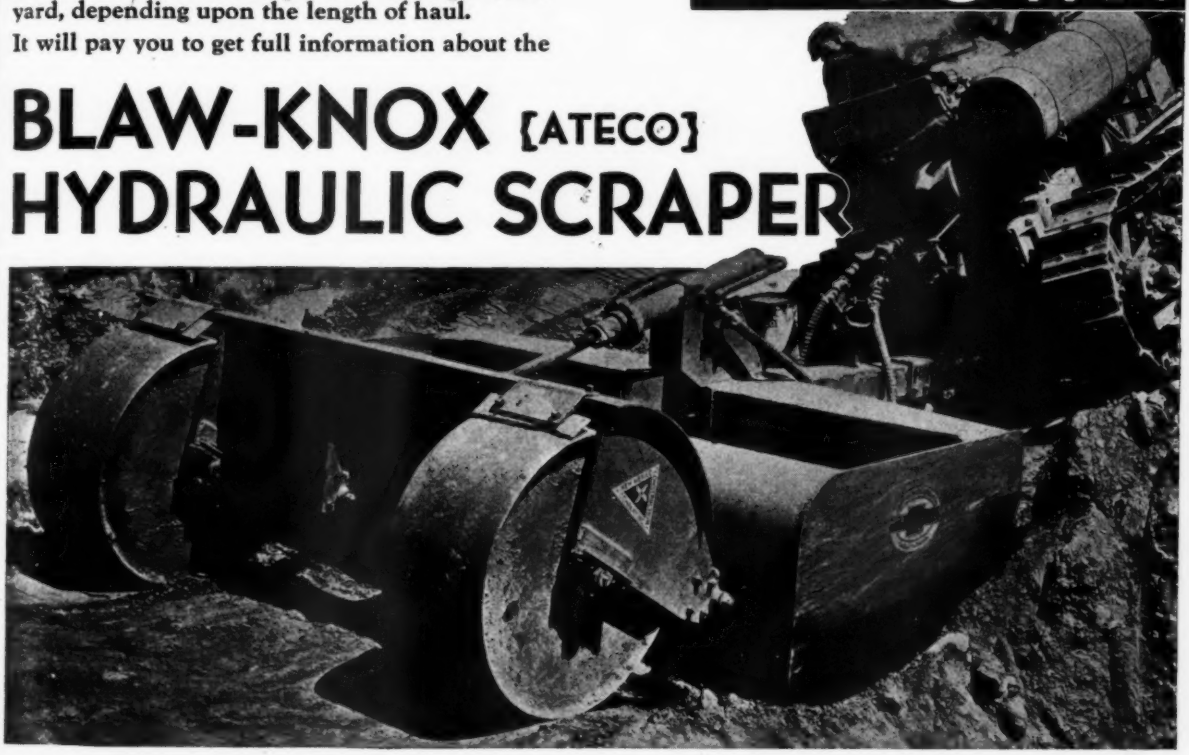

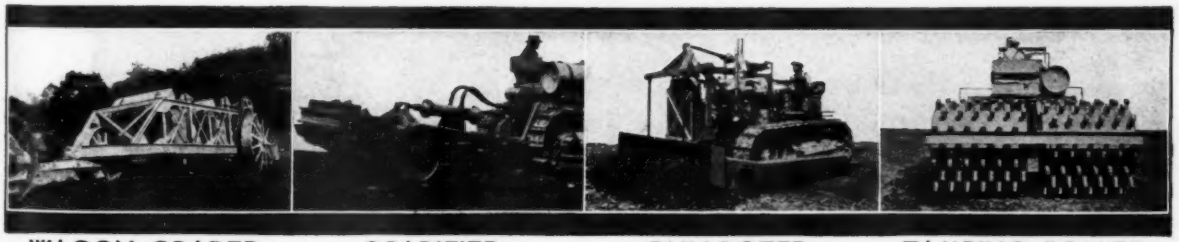

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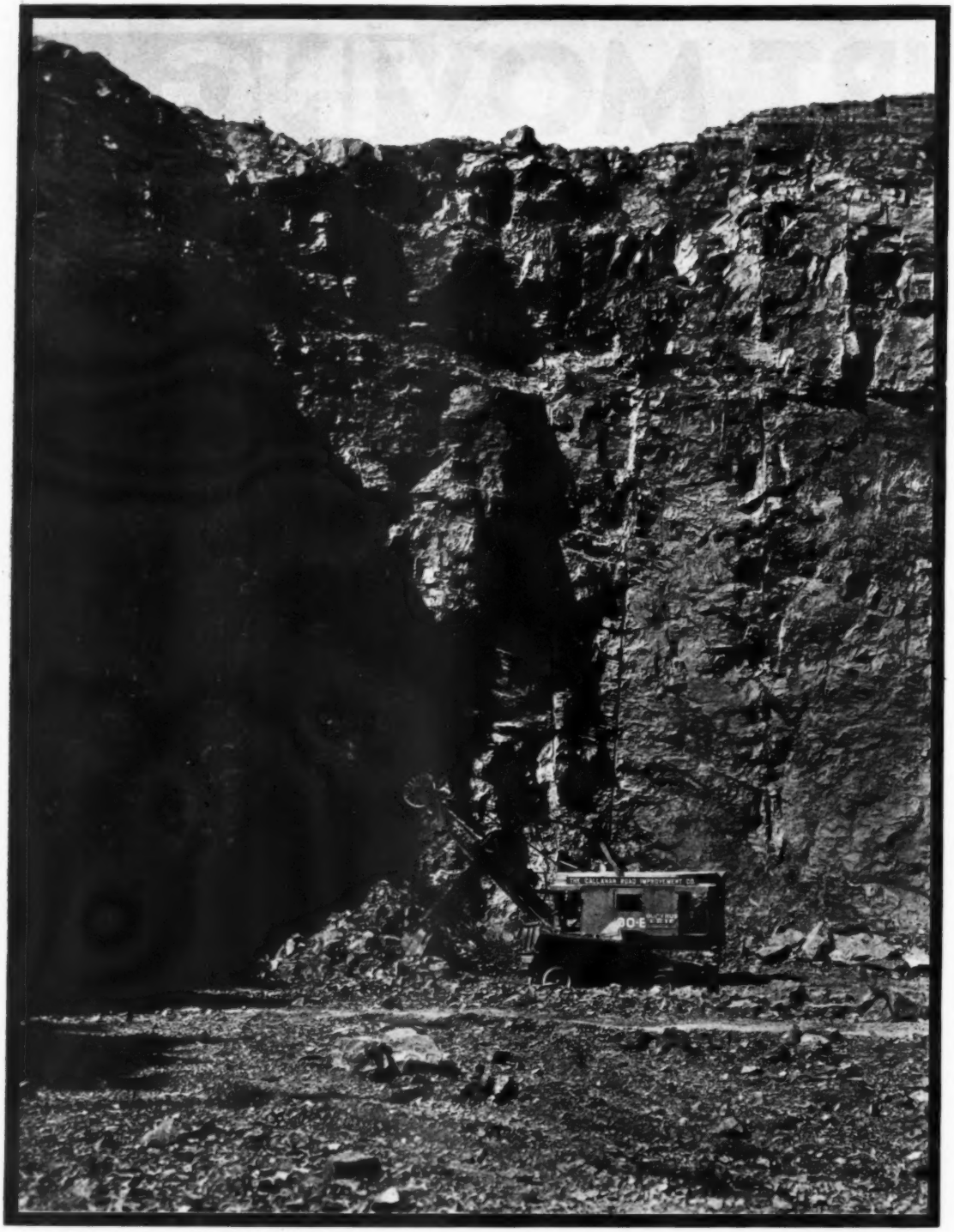


AGGREGATES « «

Many other industries depend largely on highway building for their bread and butter. Much of the stone from this quarry of the Callahan Road Improvement Company at South Bethlehem, New York, is used on highways for surfacing and aggregates. Mack trucks with Easton bodies are used for hauling—a Bucyrus-Erie 3-yard electric for loading. At their Feura Bush quarry another 100-B electric loads to cars hauled by steam dinkies.

THE EXCAVATING ENGINEER
FOUNDED 1905

JANUARY 1932
VOL. XXVI NO. 1

EXCAVATION FOR 1932 Highway Construction

Need of accelerated program more than apparent. . . Time unusually opportune

ROAD BUILDING is an unemployment relief measure which should receive especially favorable consideration this year because of the favorable prices, the benefits of lower cost transportation, and the greater safety provided by an improved highway system with wider, straighter, better surfaced highways without dangerous grade crossings.

Our motor car users pile up a mileage of over 100,000,000,000 miles annually over our 3,000,000 miles of highway. Dollars invested in bargain highway improvements this year will pay large dividends in cutting mileage costs for this increasing army of auto owners through future years. Improved roads are not only less expensive over which to operate but also less expensive to maintain.

Of the 3,000,000 miles of highways in the United States, 325,000 miles are included in the state highway systems. It is estimated that these roads carry approximately three-fourths of all rural travel. At the close of 1930 thirty percent (97,500 miles) of this state highways system mileage was without surface of any kind. Low type surfaces composed 44 percent (143,000 miles) high type pavements 26 percent (84,500 miles including 58,200 miles of concrete).

Included in the 325,000 miles of state highways are 197,000 miles of Federal Aid roads (comprising seven percent of the total highway mileage in each state). Of this Federal Aid system as of July 1st, 1931, 39 percent was paved with high type surfaces, 40 percent was improved with low or

Caterpillar, Athey and Bucyrus-Erie team up on this Chenango County, New York road work. From the picture it looks like tough digging but the Gas+Air heaps the dipper without any trouble.

medium quality surfacing, and the remainder of 21 percent was just plain dirt roads.

In 1902 the total mileage of improved roads was but 150,000 and the registration of motor vehicles was 23,000, or six miles of road per automobile. Today the mileage of improved roads is 700,000 and the number of cars 26,000,000 or 37 vehicles per mile of road. We have passed from a condition of freedom of travel to a situation where the roads are congested with traffic. Proof of this statement may be obtained from almost any automobile driver—especially a Sunday driver. Further proof is in the accident record last year when 33,000 people were killed and nearly a million injured in highway accidents.

With construction prices down about one-fifth, six miles of highway can now be improved for the same amount of money required for five miles two years ago. Today's construction dollar will buy more than any dollar since that of June 1922—and, in our opinion, more than any dollar for years to come.

Last year a special Federal Aid appropriation was made available to assist in accelerating highway construction in order to relieve unemployment conditions. It is estimated that in 1931 more than a million men worked on roads and streets and another two million were employed in furnishing materials, equipment and supplies for this construction. Because Congress has not yet authorized a second year's increased Federal Aid appropriation, the following forecast of highway construction for 1932, furnished through the cooperation of the various state highway departments, shows a decrease from 1931 in a number of states. If a similar appropriation to that of 1931 for Federal Aid is made this year the programs that follow will be increased materially. No doubt many of our readers are at present using their good efforts to bring about this highly desirable legislation.

On this highway through the Ozarks, St. Louis Contractor Len Gray found plenty of rock. Here we see his Gas+Air filling up an International from the truck fleet.

Alabama

It is not possible at the present time to give an estimate of highway work in Alabama for 1932 for the reason that there are no funds available for new construction and it will take a meeting of the Legislature to make appropriations for this purpose. However, during 1931, the Department completed 248 miles of high type paving including cement, concrete and limerock asphalt on a bituminous base. The Department also, completed 450 miles of grading, draining and surfacing of sand-clay, chert and gravel.

Arizona

The budget of the Arizona Highway Department does not follow the Calendar Year, furthermore, the class of work done after June 30, 1932, cannot be even approximately determined until the Budget is made.

The Arizona Highway Department has work enough planned to take up three times the amount of the Budget, but where the money will be spent, it is impossible to say. C. C. Small, Deputy State Engineer, reports that expenditures for the next Fiscal Year will be at least $1,000,000.00 less than they were last year.

Gravel and sand pits contribute their part to highway construction. This is one of the Bucyrus-Monighan draglines that walks along the top of the bank as it pulls up the gravel from the pit below or throws back the overburden in the pits of the Grand Rapids Gravel Company of Grand Rapids, Michigan. This one is a 2-yard electric using General Electric equipment.

Arkansas

The Arkansas State Highway Commission 1932 program will be almost entirely dependent on funds received from the Bureau of Public Roads through their annual Federal Aid apportionment, also, on such emergency appropriation as our next Congress may make.

Dependent on these conditions the contemplated program will probably consist of approximately 100 miles of grading work, 200 miles of gravel or crushed stone surfacing, 100 miles of bituminous surface treatment work and 100 miles of high type paving. This program is purely tentative at this time and as previously explained is entirely dependent on Federal Aid funds that may be available during the period 1932.

Arkansas' share of the annual apportionment of the regular Federal Aid funds is approximately $2,000,000.00 If an emergency appropriation in the same amount can be made available an approximate construction sum in the amount of $4,000,000.00 can be applied to 1932 work.

California

It is contemplated to place under way during 1932 approximately 410 miles of paving consisting of Portland Cement concrete, asphalt concrete, bituminous macadam, and oil grading, at an approximate expenditure of $23,000,000. No estimate has been made at this time of the yardage of excavation involved in this construction.

Colorado

It is impossible to give any forecast on work to be done by The Colorado State Highway Department during 1932 at the present time. The budget

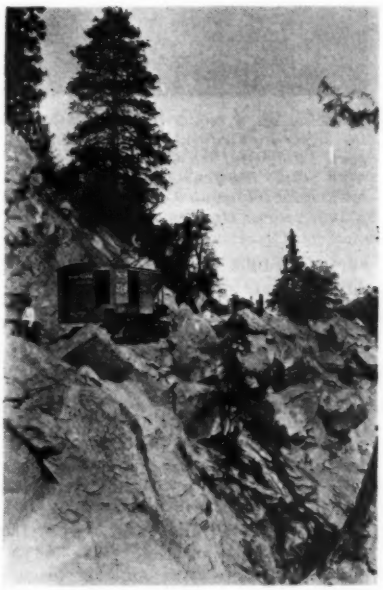
for this work is not completed until the December meeting of the Highway Advisory Board, and even after that it must await the approval of the Governor before any forecast can be given with reasonable assurance.

Connecticut

Revenue for the State Highway Department of Connecticut is derived solely from the gasoline tax, receipts from motor vehicle licenses, fees and fines. The total amount available to this department is approximately thirteen million dollars, yearly. It is impossible to give even approximate figures of the detailed expenditures at this time.

Delaware

The Delaware highway program for 1932 is expected to be approximately the same as that for 1931 according to Samuel Knopf, Principal Assistant Engineer for the Delaware State Highway Department. Mr. Knopf estimates



A tough California job this one in the San Bernardino mountains, where Crook & Henno are cutting a highway through the rock near Camp Angelus with Bucyrus-Erie 37-B gasoline and 41-B steam shovels.

total work on grading new roads at 80 miles to cost approximately $2,000,000. This is sub-divided into 40 miles of Federal Aid at $800,000 and 40 miles of state roads at $1,200,000. Yardage involved in the grading of new roads will probably be about 740,000 cubic yards and in reconstruction about 25,000. At least half of this work will be suitable for shovel operation. Delaware carries no old contracts into 1932. The paving program according to Mr. Knopf will probably include 60 miles at a cost of approximately $1,800,000 and in addition there will be 20 miles of surfacing with gravel or crushed stone at a cost of $120,000.

Florida

During 1931 Florida paved 250 miles of road and graded 183 miles. The State Road Department also had under maintenance approximately 5,000 miles of road of various classes.

Total disbursements for the year through the month of November were $8,544,561.94 for both construction and maintenance.

In 1931 the Department awarded contracts for 2,078 feet of bridges and 161 miles of road at a total contract cost of $3,374,688.02.

For 1932, it is estimated that income will be approximately $8,000,000 and that carry over under uncompleted work for 1931 will be approximately $2,500,000. The maintenance budget for 1932 is $3,500,000 and new construction will be started with the balance.

Georgia

Treasurer F. P. Vanstory of the State Highway Board wires that Georgia will probably have approximately $12,000,000 for expenditures on construction in 1932. For the first eleven months of 1931, Georgia spent about $17,000,000 for the same purpose.

Idaho

Detailed figures are not available for the 1932 program but from present indications Idaho will have approximately $2,600,000 for new construction and $1,250,000 for maintenance.

A summary of the 1931 highway work follows, showing mileage completed:

Graded	34 miles
Crushed rock or gravel	328 miles
Bituminous treated . .	176 miles
Total expenditures for construction . . .	$4,862,000
Maintenance . . .	$1,000,000

This is the kind of digging Cole brothers of Pueblo, Colorado, encountered in grading US 50 on the western slope of Monarch Pass. They have 160,000 yards of heavy grading on this job, mostly hard rock. The machine shown is one of the new Bucyrus-Erie 37-B's and Cole Brothers say they like the way she eats into the rock. Their 5-ton Internationals with the help of a couple of hired Macks are doing the hauling. A 208 P. & H. is doing some dragline work on the same job.

Illinois

Chief Highway Engineer Frank T. Sheets of Illinois estimates that 277 miles of new highways will be graded in that state during 1932 and an expenditure of approximately $3,185,500. Of this 130 miles costing $1,495,000 will be Federal Aid and 147 miles, costing $1,690,500, will be state highways. Programs for county and local roads are

On a highway near St. Louis Frank Wekerlin loads trucks with this husky Bucyrus-Erie 43-B 1¼ yard chain-crowd shovel with Wisconsin gasoline engine.

not available. Approximately 12 miles of work contracted in 1931 will be carried over into 1932 and will cost approximately $138,000. Mr. Sheets estimates the paving to be done during 1932 in Illinois at 900 miles costing approximately $20,700,000. This forecast does not include any separate bridges, highway or railroad grade separations or city belt line construction. Nor are estimates available on reconstruction for surfacing with gravel and crushed stone.

Indiana

The program has not reached the point where detailed information can be given; however, the Indiana State Highway Commission plans to pave and surface approximately 460 miles of road during 1932. Plans also include construction of the Forsythe Avenue viaduct in Hammond, Indiana, which crosses fifty-six tracks of the New York Central, Indiana Harbor Belt, and Michigan Central Railroads. The estimated cost of this structure is $1,050,000.

Also included in the construction program is approximately sixty miles of heavy paving and grading on U. S. No. 50 between Shoals and Seymour. Seven miles of light construction was completed last year at a cost of $127,000 per mile including bridges. Due to the abnormally heavy grading, only approximately eleven miles of this road will be paved during 1932. The remaining fifty miles will be graded, and the estimated cost of this work is $40,000 per mile.

The total estimated amount of revenue of the Indiana Department during the fiscal year is approximately $22,000,000.00. In addition there will be available $6,000,000,000 which was the balance on hand at that start of the year.

Iowa

According to a wire report received just as we go to press Iowa State Highway Construction Program for 1932 will include approximately 200 miles pavement, 350 miles grading and bridging, and 675 miles of untreated gravel surfacing work. Funds available for construction work approximate 40% of amount expended in 1931.

Kansas

W. V. Buck, State Highway Engineer of the State Highway Commission of Kansas, in a statement released for publication in The Excavating Engineer says:

"Construction work has progressed upon the state highway system until I am able to advise you today that 62 percent of the state highway system of 8690 miles is now surfaced, of which 14 percent is hard-surfaced (that is, brick, concrete, bituminous macadam or bituminous concrete).

"There have been completed upon the state highway system since April, 1917 and up to October 1 this year, 480 miles of earth grade, not now surfaced (which will be graveled yet this fall); 4086 miles of gravel and sand gravel; 84 miles bituminous blotter treatment and bituminous surface mix (there will actually be 825 miles of this type of work in use this winter); 1206 miles of hard surfaced road, making a total of 5376 miles of roads on the state highway system now surfaced.

"There was under contract and uncompleted upon October first: 524 miles of grading and culverts at a contract price of $1,751,852.75, 102 miles of sand-gravel surfacing at a contract price of $298,449.26, 651 miles of bituminous blotter treatment and bituminous surface mix at a contract price of $999,632.84, 148 miles of hard surface at a contract price of $3,984,896.56 and 205 bridges at a contract price of $2,290,960.34, making the total price of uncompleted contracts $9,325,791.18. Upon the same date (October 1, 1931), there were reconstruction and regraveling contracts that were uncompleted, covering 915 miles at a contract price of $548,426.18. A large percentage of this work is completed, and much of it it is in use today. Upon November 1, there still remained unearned on construction contracts $2,463,693.50 and unearned upon reconstruction and regraveling contracts $90,874.92.

Maintenance is a considerable item in State Highway budgets. Here is a part of a fleet of 100 Four-Wheel-Drive 3½-ton trucks recently purchased by the Division of Highways, New York State Department of Public Works. A previous order in 1931 called for 50 of this model.

"For the twelve month period from October 1, 1930 to September 31, 1931, there was expended for construction work upon the State highway system $11,399,915.39. The work completed and accepted during this period consists of 141 miles of grading and culverts, not surfaced; 1002 miles of gravel surface; 84 miles of bituminous blotter treatment; 107 miles of hard surfacing, making a total of 1475 miles and 179 bridges.

Working on a clover-leaf separation on the super-highway near the Newark Airport, Linde-Griffith Company of Newark used this Bucyrus-Erie 42-B steamer with an 8200 pound Union steam hammer to drive piling.

"During this same period, the State Highway Commission awarded contracts for 404 miles of grading at a contract price of $3,139,003.77; 587 miles of gravel at a contract price of $677,980.38; 657 miles of bituminous treatment at a contract price of $1,032,000.07; 148 miles of hard surface at a contract price of $3,983,537.34; and 175 bridges at a contract price of $1,757,623.88; making a total of 1796 miles of highway construction at a contract price of $8,832,521.56 plus 175 bridges at a contract price of $1,757,623.88, or a grand total of $10,590,145.44.

"On the construction work done during this last year, the state received from the Federal government emergency funds in the amount of $2,192,301. A like sum will not be available for 1932 construction. Our Federal Aid apportionment for 1932 is $3,327,526.00, less one-fifth of the emergency fund as advanced us last year, or $438,460.20, making our actual Federal Aid as available for the calendar year 1932 $2,889,065.80.

"Construction work under the 1932 program contemplates the improvement of 635 miles of grading and culverts, 875 miles of gravel and bituminous surface roads, and 100 miles of hard-surfaced types."

Hodgkin-Adams Company, Inc., of Winchester, Kentucky used this outfit on their road job near Springville, Indiana. The shovel is a Bucyrus-Erie GA-3, the tractors Caterpillar Sixtys, the wagons Athey 3-way dumps.

Kentucky

Until the State legislature apportions revenue for 1932 highway construction it is impossible to forecast Kentucky's program. From April 1st to November 1st the State Highway Department contracted for grading and drainage on 589 miles costing $5,129,-953; macadam on 387 miles at $2,828,-586; graveling 105 miles costing $398,387; rock asphalt 122 miles for $2,585,295; reinforced concrete 302 miles for $6,209,933; and other items making a grand total of $18,876,456. A toll bridge over the Cumberland at Canton will be let January 1st; one over the Tennessee at Eggner's Ferry, another over the Kentucky at Tyrone will be let March 1st, while others over the Ohio at Henderson and over the Tennessee at Paducah have not been scheduled for date of bidding.

Louisiana

While it is expected that the Louisiana program for 1932 will involve a decrease of 50 per cent under last year it is probable that about 2600 miles of new roads will be constructed involving 10,000,000 cubic yards of excavation. In addition 2,000,000 cubic yards are carried over on last year's work. Louisiana will probably pave approximately 600 miles during 1932 and expects to surface with gravel or crushed stone 2600 miles.

Maine

While plans for the state of Maine have not yet been prepared a tentative estimate may be made of 639 miles of reconstruction at a cost of approximately $8,798,170 of which 113 miles costing $3,638,860 are Federal Aid, 26 miles costing $659,319 State roads, and 500 miles costing $4,500,000 are on State Aid 3rd Class and Special Resolves. It is expected that 88 miles will probably be paved at an estimated cost of $3,398,750 and 500 miles will probably be surfaced with gravel or crushed stone at an estimated cost of $5,399,420. The yardage of excavation involved including the gravel will probably be 4,000,000 cubic yards, about 80 per cent of which is suitable for shovel work. In addition there is carried over on old contracts 28,000 cubic yards of excavation at an estimated cost of $10,000. This tentative program involves approximately the same expenditure as the program of 1931.

Maryland

The Department of Public Works advises that information on Maryland's 1932 highway program is not available at this time. Roads and Streets magazine estimates the Maryland highway expenditure for new construction and reconstruction at $10,000,000.

Massachussetts

The Department of Public Roads is unable at this time to estimate the excavation for their 1932 program. During the fiscal year of 1931 contracts were awarded covering 320 miles of hard surfaced roads and about 65 miles of gravel roads at an approximate cost of $19,000,000. It is anticipated that about the same mileage will be contracted for in 1932.

Michigan

Grover C. Dillman, State Highway Commissioner advises that, in order to provide winter employment for approximately 30,000 workers, Michigan State Highway Department is rapidly placing under construction a $10,000,000 winter road construction program consisting mostly of grading drainage structures, grade separations and bridges, also betterments. A large number of the projects now being placed under construction include surfacing to be placed during 1932. In order to insure that the work as specified shall be carried on this winter, the Department has estimated the amount of each contract that can be carried on during the winter and are requiring that the contractor shall have the percentage as estimated completed on or before April 1, 1932.

The Department is including in the special provisions set up in the proposals that a definite type and amount of equipment be used, stipulating some work for hand labor; the use of team powered wheelers or equivalent equipment, and permitting the use of a definite number of power shovels, with a limited capacity for trucks used in moving the earth away from the power shovels.

In order to provide a maximum number of men with work the Department requires that to the fullest extent possible all employees on State Highway projects shall work part time, either three days a week or alternate weeks. In connection with employment, it is specified that the contractor shall employ not less than 75 per cent of all labor used on the work from lists of unemployed furnished by the State Employment Commission through its local committees, and that a minimum wage of 35c per hour be paid. In this way the contractor is permitted 25 per cent of the force to consist of his foreman, machine operators and other key men essential to the efficiency of his organization.

Projects are being placed as far as possible according to the urgency of the need for unemployment relief. While all sections of the State are being granted a portion of the work, the need for relief is most acute in the southern part of the lower peninsula, and this need will receive first consideration as it is the object back of the entire program.

Mr. Dillman states: "I regret that I cannot give you a definite program at this time extending beyond April 1st, 1932. The emergency winter work will nearly exhaust our 1932 estimated receipts, which would normally be available for Spring and Summer construction, and it is apparent that contract awards after the above mentioned date will be materially below those of corresponding years. I regret that I cannot forecast our plans at this time beyond the emergency period."

Caterpillar Sixtys pull LaPlant-Choate 6-yard wagons from a Lorraine while another Sixty with LaPlant-Choate bulldozer spreads the fill on this Colorado project near Steamboat Springs. Sanders Bros. Construction Company of Las Vegas is doing this job of widening on U. S. 40 across Rabbit Ear Pass (elevation 10,000 feet) for the U. S. Bureau of Public Roads.

Minnesota

The following mileage of work is contemplated in Minnesota for 1932:

	Mileage	Ave. Cost Per Mile	Estimated Cost
Paving	430	$23,000.00	$ 9,890,000.00
Grading	700	11,000.00	7,700,000.00
Gravel Surfacing	400	2,000.00	800,000.00
Bituminous Treatment	300	1,500.00	450,000.00
			$18,840,000.00

State Highway work in Minnesota averages approximately 30,000 cubic yards per mile and it is estimated that about 25 per cent of the proposed work would be suitable for shovel operations.

It is impossible to give any outline of the work contemplated by the counties or townships.

One of the jobs handled by A. Guthrie Company Inc., of St. Paul this past season was 11.2 miles on Minnesota Highway No. 1 between Cross River and Lutsen. Here is a battery of Gardner-Denver air drills preparing the way for the powder monkeys and the 50-B Bucyrus-Erie Diesel shovel in cutting through a hill of solid rock on this beautiful highway along the north shore of Lake Superior.

Mississippi

At this time the State Highway Department is unable to make any plans for construction during 1932. A bond issue of $5,000,000 has been authorized with which to match an equal amount of Federal aid, but in view of the bond market it seems that there may be difficulty in disposing of the bonds. This being true, it is probable that Mississippi will not have much construction under way during 1932.

During 1931 Mississippi built 153 miles at an expenditure of $654,000. 27 miles were reconstructed at a cost of $146,000. This work involved a total excavation of 3,500,000 cubic yards, approximately 50 per cent of which was handled by power excavators. 72.8 miles of Mississippi highways were paved during 1931 at an approximate cost of $1,500,000.

It is impossible to forecast the program for 1932 as this depends upon the sale of state highway bonds.

Missouri

Chief Engineer T. H. Cutler, of the Missouri State Highway Department, forecasts a very active program in this state during 1932. It is expected that 2105 miles of new roads will be graded at an expenditure of $15,099,996. In addition 29 miles is scheduled for widening at a cost of $1,035,000. This work will probably involve 19,000,000 cubic yards of excavation, at least a quarter of which will be suitable for shovel operation. In addition there are 1,900,000 cubic yards on old contracts to be carried over at a cost of $760,000. Mr. Cutler estimates that 382 miles of highway will be paved at a cost of $9,672,704 and 2034 miles will be surfaced with gravel or crushed stone at a cost of $6,005,772. The total amount of highway construction for Missouri will be 2,489 and the total construction expenditure $30,778,472. The expense of this program is approximately the same as that carried on in 1931.

Montana

R. D. Rader, State Highway Engineer of the State of Montana Highway Commission, estimates that Montana will grade 335 miles of Federal Aid highways in 1932 at an estimated cost of $3,000,000. This will probably involve some 7,000,000 cubic yards of excavation. In addition Montana will carry over contracts involving 3,500,000 cubic yards of excavation at an estimated cost of $750,000. No paving is included in 1932 plans but approximately 350 miles of highway will be surfaced with gravel or crushed stone at an approximate cost of $1,000,000. The above forecast indicates a decrease of 50 per cent from the 1932 program due to the fact that no emergency Federal funds are included in this years estimate. Last year emergency Federal Aid placed $3,500,000 of additional funds into Montana's program. It is, of course, possible that Congress will make similar emergency appropriations this year and if so there will be a corresponding increase over the estimate given above.

This Lundin Brothers job near Hastings, Minnesota with Bucyrus-Erie 37-B loading to Will truck was snapped by our good friend M. V. Burton of Western Wheeled Scraper Company. Lundin Bros. subbed this work on new Highway No. 12 between Excelsior and Hopkins from R. P. England. Mr. Burton comments that he heard enthusiastic comments from the boys on the job regarding the new 37-B.

On the Guthrie job on the scenic North Shore Drive from Duluth to Port Arthur we find this No. 12 Pioneer Gravel Plant of Victor Nelson's preparing gravel for the new road. Power is furnished by a Caterpillar Sixty and the gravel is loaded to trucks.

Nebraska

E. J. Babcock, Jr., Assistant Office Engineer for Nebraska's Bureau of Roads and Bridges, forecasts a decrease of 20 per cent in Nebraska's road program expenditure for 1932 as compared to 1931. It is expected that Nebraska will grade 658 miles of new road at an expenditure of $1,333,000 of which 267 miles costing $772,000 will be on Federal Aid roads and 391 miles costing $561,000 will be on State roads. The excavation required is expected by Mr. Babcock to amount to 9,500,000 cubic yards. In addition 450,000 cubic yards costing $90,000 is carried over on old contracts, not including grading and structures. It is expected that $1,513,000 will be spent in paving 125 miles of Nebraska's highways, and $727,000 for gravel and crushed stone surfacing on 767 miles.

Nevada

Following is a summary of the tentative 1932 program:

New Construction
- Gravel surface type — 7 Miles
- Estimated cost ____ $ 51,000

Reconstruction
- Widening existing gravel surface highway and placing additional surfacing material ——— 162 Miles
- Estimated cost ___ $1,150,000
- Widening existing 15-foot cement concrete pavement to 20 feet using asphaltic concrete for the additional width and new surface __ 14 Miles
- Estimated cost ___ $ 483,000

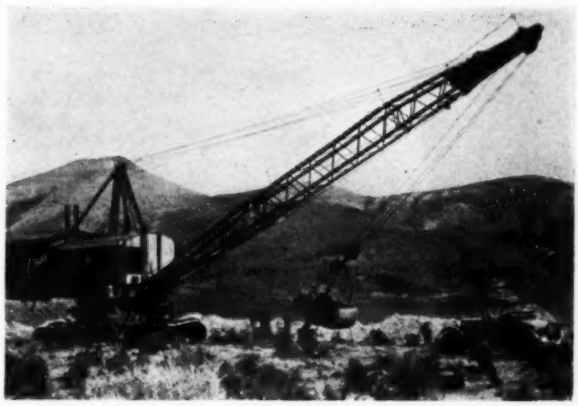
(Continued on Page 52)

Bureau of Reclamation reports 1931 excavation totaling 11,691,313 yards

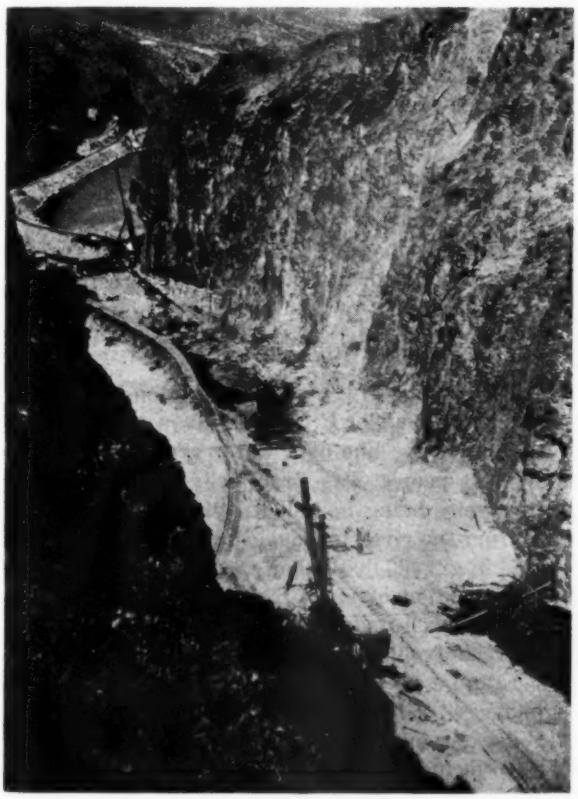
Work for present fiscal year shows material increase with $23,046,900 assigned to construction

ACCORDING to the annual report of Dr. Elwood Mead, Commissioner of Reclamation, construction expenditures for the Bureau during the fiscal year ending June 30, 1931, amounted to $10,843,700 and may be compared with $8,611,400 for the previous fiscal year.

For the current fiscal year ending June 30, 1932, the Bureau plans a construction expenditure of $23,046,900 divided as follows: Storage Systems, $18,697,000; Canal Systems, $2,578,000; Lateral Systems, $827,900; Drainage Systems, $514,000; Power Systems, $430,000.



J. A. Terteling & Sons of Moscow, Idaho used this Bucyrus-Erie Class 14 Diesel-electric dragline on their contract on the Vale Project near Harper, Oregon.



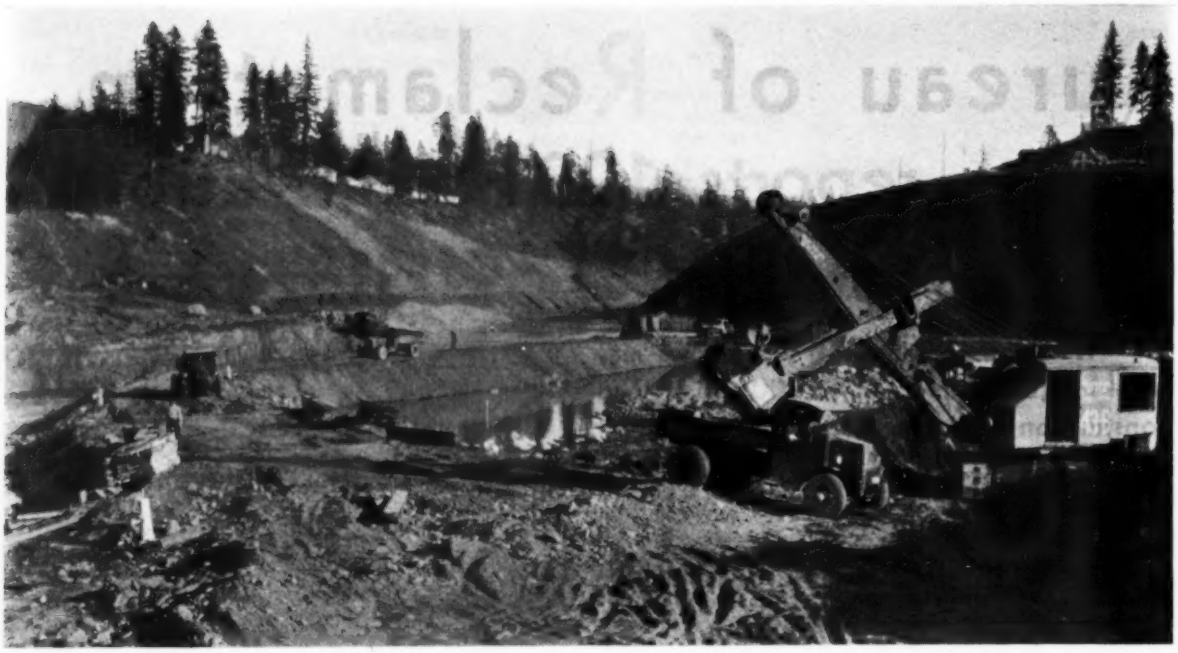
General Construction Company of Seattle are building Owyhee Dam near Nyssa, Oregon. 540,000 of excavating, 800,000 yards of gravel are required. To be completed in 1933, it will irrigate 125,000 acres.

Included in the above schedule the apportionment to various major projects is as follows:

State	*Project*	*Amount*
Idaho	Boise, Storage	$ 250,000
Idaho	Minidoka, Gravity System	550,000
Montana	Sun River, Canals	200,000
Oregon	Owyhee, Dam and Canals*	3,000,000
Oregon	Baker, Thief Valley Dam	250,000
Oregon	Vale Project	165,000
Oregon	Klamath, Tule Division	200,000
Utah	Salt Lake Basin	400,000
Washington	Yakima, Cle Elum Dam	1,200,000
Washington	Yakima Kittitas Div. Canals†	866,000
Washington	Yakima, Kennewick Div.	400,000
Arizona, California, Nevada	Boulder Canyon Project Hoover Dam	15,000,000

*See page 12 The Excavating Engineer for January, 1931—"Unusual Device Used for Dewatering at Owyhee Dam".

†See page 281 The Excavating Engineer for June, 1931—"Canal Reclaims 72,000 Acres".



Construction of Cle Elum Dam near Ronald, Washington is going rapidly forward. Winston Brothers Company of Minneapolis are handling this job with W. H. Gardiner of their Seattle office in charge.

The area irrigated from Government works was 2,790,856 acres, an increase of 72,726 acres over the preceding year. The area cropped was 2,805,460 acres, an increase of 100,220 acres. The crops produced on this area were valued at $119,661,820, a decrease of $41,518,060 compared with 1929, owing to the agricultural depression and the prevailing low prices for practically all crops. Since water was first available in 1906 the cumulative value of crops grown on land irrigated from Government works is $1,761,929,500, or about seven times the amount the bureau has expended to date.

There are on the 25 operating projects 40,354 irrigated farms, with a population of 165,956; 213 cities and towns with a population of 472,723; 688 schools, 724 churches, and 120 banks with deposits of $134,261,170 and 226,014 project and non-project depositors.

Boulder Canyon Project

The work accomplished on the Boulder Canyon project during the year is impressive in its magnitude and because of the speed which has been made in transforming a desert waste into a hive of constructive activity.

The project was formally inaugurated with the approval by President Hoover on July 3, 1930, of the first appropriation of $10,660,000. A further appropriation of $15,000,000 was made on February 14, 1931.

On March 11, 1931, Secretary Wilbur signed the award of contract to the Six Companies, Inc., of San Francisco, the low bidder, for the construction of the 730-foot Hoover dam, the power plant, and appurtenant works, at the bid price of $48,890,995.

A 22.7 mile railroad has been constructed from the main line of the Union Pacific System near Las Vegas, Nev., to Boulder City, the headquarters of the construction force and the Federal employees associated with the work. Construction had begun on another railroad 10 miles long, connecting Boulder City with the dam site, and on still another, 20 miles long, with one branch running to the tunnel outlets on the Nevada side and the other to the deposit of sand and gravel in Arizona.

A transmission line 235 miles long, to furnish power for construction purposes, was erected from Victorville, Calif., to Hoover dam site, over which power was being delivered at the end of the fiscal year.

A 24-foot oiled highway, 7 miles long, was completed from Boulder City to the dam site.

A 9-mile pipe line of a water system to provide for 5,000 people was practically completed, and pumps were being installed to lift the water 2,000 feet from the river to Boulder City where it will be stored in a 2,000,000 gallon tank.

Construction of six 3-room and six 4-room cottages was well under way, and the Six Companies had erected office buildings, mess houses, dormitories, and a number of 4-room houses for married employees.

Bids were opened on June 30 for work at Boulder City to include street, alley, parking area and sidewalk grading; street paving; street and parking area surfacing, curbs, and gutters; sidewalks; sanitary sewers; and a water distribution system.

Market progress was being made by the Six Companies in the excavation of the four tunnels.

each 50 feet in diameter and with a total length of 3.1 miles, through which the Colorado River will be diverted during the construction of the dam.

Other Notable Construction Work

Other construction on the Federal irrigation projects during the year included the completion of Echo dam on the Salt Lake Basin project, Utah, and Deadwood dam on the Boise project, Idaho. Plans and specifications were also prepared for construction of the Cle Elum dam on the storage division of the Yakima project, Washington, and the Thief Valley dam on the Baker project, Oregon, both structures to be advertised for bids early in the ensuing fiscal year.

405-foot Owyhee dam on the Owyhee project, Oregon, was 72 per cent completed at the end of the fiscal year.

The Denver office designed and wrote specifications for the Madden dam and power plant, Canal Zone, Panama, on which the Panama Canal will start construction the latter part of 1931.

Construction Results

At the end of the fiscal year the bureau had constructed 17,467 miles of canals, ditches and drains; 132 tunnels, with a total length of 40 miles; 165,427 canal structures; 12,194 bridges with a total length of 56 miles; 15,787 culverts; and 5,540 flumes. The bureau had laid 4,436,952 linear feet or 840 miles of pipe and had constructed 1,461 miles of road, 117 miles of railroad, 4,011 miles of telephone line, and 3, 226 miles of transmission line. Excavation during the fiscal year amounted to 11,691,313 cubic yards, bringing the total excavation to the end of the year to 303,797,172 cubic yards.

Two hundred and one irrigable farm units were opened to entry during the fiscal year, most of which were entered by qualified settlers.

Need for Additional Funds

During the winter of 1930-31 construction under the large contracts on the Owyhee, Vale, and Kittitas projects was being carried on at an almost unprecendented rate owing to mild weather. Repayments from water users had fallen off as a result of adjustment contracts extending the period of payment. As a result, money needed to pay workers and complete important contracts was rapidly being exhausted and a point was being reached where it would be ncessary to shut down construction and discharge 1,000 to 1,500 employees. This was of course to be avoided if possible.

The situation was presented to Congress with the request that a mortatorium be granted on the repayment to the General Treasury of $1,000,000 a year on the bond loan of $20,000,000, on which $11,000,000 had been repaid. A further request was also made for a loan from the Treasury of $5,000,000 to meet contract obligations and complete construction urgently needed.

As a result laws were enacted authorizing a moratorium of two years on the repayment of the bond loan and also authorizing the loan of $5,000,000, repayment of which at the rate of $1,000,000 a year is to begin in 1933, so that the bureau must

Another view on Winston Brothers Company operations at Cle Elum Dam. The dragline in the foreground loading to the Mack truck is a Bucyrus-Erie Gas+Air. At the left a Bucyrus-Monighan Walker.

return to the General Treasury $2,000,000 annually for five years beginning in that year. These payments will result in a material reduction in the yearly construction revenue of the bureau.

Reclamation Fund Should Be Safeguarded

Dr. Mead points out that it is important for the future welfare of the public land states that it be more generally appreciated that the Reclamation Fund, established for the development of those states, can accomplish this great work only as it has money available to carry on construction of needed feasible projects. If payments due the fund from existing projects are deferred or if income from power, logically belonging to the fund, is diverted to the benefit of individuals on projects favorably situated for power development, the general progress of Western development is to that extent handicapped.

Oh, Inspector!

A woman arriving in this country after a short visit to the continent was asked the usual question by the customs official at the leading port—"Anything to declare, madam?"

"No," she replied, sweetly, "nothing."

"Then, madam," said the official, "am I to take it that the fur tail I see hanging down under your coat is your own?"

The bride was very much concerned at seeing the twin beds in their bridal suite.

"What's the matter dearest" inquired the attentive bridegroom.

"Why, I certainly thought we were going to have a room all to ourselves."

Thanks to Harry Craig,

Allegany County Builds Highways with a SYSTEMATIC PLAN

New York County Highway Superintendent, in spending highway budget of $300,000 a year, gives citizens the most for their money.

By Lloyd S. Graham

HARRY CRAIG, in his sixteen years of effort and leadership as highway superintendent of Allegany County, New York, has seen many changes and has evolved a method of operation which is indicative of the modern manner of thinking and doing things among highway officials everywhere. Sound engineering, based on the experience of the years past and studious anticipation of the county highway traffic needs of the future; rugged, modern equipment designed and produced by responsible makers; and careful systematic maintenance of such equipment, are some of the most essential points in Mr. Craig's policy and operation.

County Superintendent Harry Craig

In many respects Allegany County may be considered average. It has no large cities which may be taxed to support an ambitious highway construction and maintenance program. The largest community is under 5,000 population. The chief industry is agriculture although petroleum production is an important factor and it was near the present village of Cuba in this county that petroleum was first discovered, coming naturally from the ground in a spring. But, on the whole, Allegany County is like hundreds of other counties throughout the country. Its highway budget for all work is only about $300,000 annually of which more than two-thirds constitutes a refund from the state as the county's share of the gasoline tax. Any highway official or contractor knows that it is no child's play to accomplish a really constructive county program with that amount of money. Yet Harry Craig has done it.

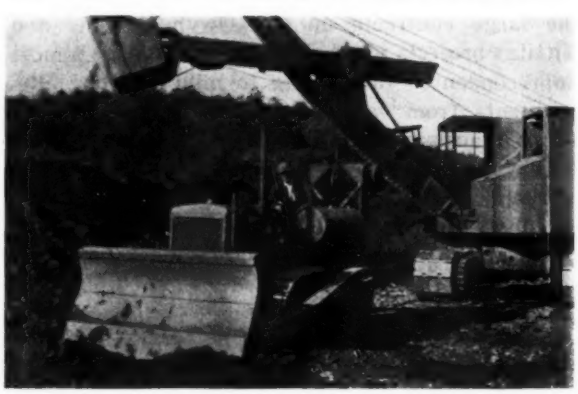
150 miles of County Roads

There are about 2,000 miles of roads in Allegany County of which about 225 miles are main routes under direct State maintenance and control. The county system as organized by Mr. Craig, with an eye to giving the greatest possible number of farmers the greatest possible use of improved roads for marketing purposes, consists of about 150 miles already constructed and 100 miles to be completed in 5 years.

The topography of the county is unusually rough. It is on the fringe of the Allegany Mountains which lie to the South. There are high, heavily-wooded hills, countless streams subject to swift, torrential rises, and difficult grades are the rule.

1931 Projects Require 100,000 Yards of Excavation

Five projects constituted the program for 1931, including a partially completed project of 1930. One of the most difficult jobs was three and one-half miles from the village of Whitesville to the



LaPlant-Choate bulldozer and Caterpillar tractor keep the grade level and save time the shovel would require for finishing up.

Typical Allegany County job—cutting through to straighten and lower the grade on an old county road near Bolivar.

Pennsylvania state line in the direction of North Bingham, Pennsylvania. The average earth movement on this job was 10,000 cubic yards to the mile, 25 per cent of which was rock. The old road was crooked and narrow, following the contours with about the science of a cowpath. Many of the curves were eliminated, others improved and consistent, comparatively gentle grades were maintained on the new road. To do this, three bridges had to be built and these were handled under contract. A stream, raging at flood time, paralleled the old road and this had to be permanently located which meant putting a shovel and other equipment into the stream bed, cleaning a part of it out and excavating for a mile of channel on new location. This included taking out earth, straightening the stream, and pulling out all sorts of obstructions including rocks, trees, tree trunks and a tangle of brush. The excavation required in the stream bed was in addition to the figures already given for excavation on the road.

A second project was from Birdsall toward Dalton for a distance of ten miles. A third project was 3.3 miles in the townships of Clarksville and Genesee. This one was started in the fall of 1930, when all of the grading and base was prepared, and the work finished in April and May of this year. A Type 4 "blacktop" mix was used to surface these roads. Here were many stiff and long grades. At one point an 18 per cent grade was reduced to 12 per cent through careful engineering and intelligent earth disposal.

A fourth project, finished in October of this year, was six miles between Wellsville and Shinglehouse. This included four bridges done by contract and the usual reduction of grades and straightening. This last project to be finished was 3.5 miles in the Township of Wirt, near Richburg. Here, too, was an old, narrow road which had been impassable for weeks both Spring and Fall.

¾-yard Bucyrus-Erie averages 800 to 900 cubic yards per shift

The writer was on this last project on October 2nd, and saw about two miles of the excavating and preparation for the base completed. Under reasonable weather conditions, it was expected that the entire job would be done by October 1t5h.

Cutting the level for the new road was a Model 1030 Bucyrus-Erie gas shovel with a three-quarter yard dipper, put in service for the first time on April 15th. Hal W. Talbett, who handles the details of field operations for Mr. Craig, said that this shovel had been operated every day with the exception of extremely rainy ones with no lost time except for about three hours. Under all kinds of conditions, with due credit to the able Operator Herman Howes, it had handled daily between 800 and 900 cubic yards. One day Mr. Howes put it through it's paces for a record of 1,050 yards. Shifts are nine hours a day—from 7 o'clock to 5.

On the day of the writer's visit, Operator Howes was ill and his place had been taken by Carl Schneider who ordinarily handles a Bucyrus-Erie,

Short hauls are planned for Allegany County dirt moving wherever at all possible. That permits tractor-wagon hauling which Mr. Craig finds most practical for distances to 1000 feet.

Type A steamer, five-eighths yard capacity, bought in 1924. Two Caterpillar tractors, each coupled to a Smith crawler type wagon, were hauling the earth away. One wagon was 6½ cubic yard capacity and the other was 8½ capacity. Following up the shovel was a Caterpillar Thirty, equipped with a LaPlante-Choate Bulldozer which did all of the leveling. The crew consisted of a shovel operator, pitman, a driver for each of the tractors and the bulldozer, and two men trimming the shoulders. No horses were used on the job at all, though a team or two were rarely hired for some odd job.

Oiling and Greasing by Special Service Crew

It was by coincidence at the time of this visit that the equipment here was receiving it's weekly greasing. In the Craig method of operation, a service truck with grease and oil visits every piece of equipment once each week while it is in the field, changes the oil and does a complete job of greasing. Two men handle this and make any other minor needed adjustments at the time. Mr. Craig believes it is more efficient to handle the greasing in this way. In addition to this weekly greasing and check-up, each operator and driver is responsible for the minor daily service needed.

Tractors and Wagons Claimed Best Dirt Movers on this Type Work

One service truck and three one-half ton trucks are the only trucks owned in the county highway service with the exception of a large GMC with flat body and extra long wheel-base which is used in transporting equipment from one job to another. Heavy equipment is invariably transported in this manner rather than by it's own power and experience has proven to Mr. Craig that, for his purpose, this method is by far the most economical in the long run, reducing wear and tear on equipment considerably and saving much time. For long hauls necessary to deliver material for base or top, it has been found that rented trucks are an economy over a fleet owned by the County.

Trucks are rarely used for dirt hauling, never unless the haul is 1,000 feet or over. Under that distance, Mr. Craig finds the tractors and wagons most practical. As a matter of fact the work is planned so that they rarely have to haul farther than 500 or 600 feet. On the day the writer was on the job, they were hauling to a distance of about 250 feet from the shovel.

Other equipment included in the Allegany County Highway Department list besides that already mentioned, includes five Adams graders, four Buffalo-Springfield gas rollers equipped with scarifiers, three other shovels consisting of one Bay City ⅜ yard Gas and two Type A Bucyrus-Erie steamers each of which have five-eighths yard dippers. The latter were bought in 1924 and 1925 respectively. There are also altogether eight Caterpillar tractors, three Smith wagons of the crawler type and three Watson Wagons of the wheel type, five of these wagons are 6½ yard capacity and one 8½ yards.

So much for the equipment. Now let us turn again to the policies which have made this county work so successful, considering the amount of money available.

Unit Planning Eliminates Politics

The county unit system of road improvement has now been adopted throughout New York state, but

Bucyrus-Erie ¾-yard gas shovel, Caterpillar Tractors, and Smith crawler wagons average 800 to 900 yards per nine hours on this job with the record at 1050.

it was adopted in Allegany County in 1925, about four years before it's state-wide adoption. Before that time, each town demanded it's share of the road money in the form of a mile or so of road within it's borders with the result that it was next to impossible to develop a real system of roads which would serve all to the best advantage. This scattered construction also made operations expensive and the old plan was generally ineffectual and political in nature.

Under the county unit plan, Mr. Craig proposed the development of certain definite routes over a period of years, a system designed to give the

(Continued on Page 31)

Schrader and Vandenberg
find profits in small strip mine

Adding a generous amount of hard work to a goodly portion of brains, proves correct recipe for the "desert of success".

THIS TALE might be entitled "Little Stories of Successful Men." Three years ago A. J. (Jack) Schrader and Clarence Vandenberg with a Type B Bucyrus-Erie of early vintage, a conveyor-type loader, one truck and cash in the amount of $220.00 started in the coal stripping game. Two hundred dollars went to the Erie Railroad Company for freight, leaving them with $20.00 for working capital.

It is a tribute to the ingenuity and industry of these two resourceful gentlemen that in less than three years they have acquired three Bucyrus-Erie Gas+Air shovels, ten five-cubic-yard Mack trucks —all on dual pneumatics, five tractors—one a Caterpillar Thirty, the others 15-ton Cletracs, two Keystone 6" gas drills, a 120-cubic-foot Schramm Compressor, a satisfactory machine shop and a complete store of repair parts for their various pieces of equipment—not to mention "money in the bank."

Schrader & Vandenberg are using this equipment in a coal mine at Avoca, Pennsylvania where they have a contract on a royalty basis.

They strip the overburden averaging about 25 to 35 feet in depth with their Gas+Airs, hauling the dirt to dumps with their Macks. The 6 to 10-foot seam of anthracite coal is also loaded out by the Gas+Air shovels and hauled to railroad siding with the Macks where it is dumped in cars and shipped to colliery. Before loading the coal it is cleaned with bulldozers attached to tractors. Schrader & Vandenberg sell the coal to collieries in the vicinity, pay their royalty and expenses, bank the profits.

Partner Clarence Vandenberg takes a turn at the levers of the newest Gas+Airs. Partner A. J. Schrader (in circle) looks on approvingly.

The accompanying photos were taken at the time of the installation of their third Gas+Air, which is equipped with an 18-foot 4-inch boom, 24-foot sticks and a 1¼-cubic yard dipper.

Both Mr. Schrader and Mr. Vandenberg credit their Gas+Air shovels with having been in a major part responsible for their success. While that may be true, it is also true that not only the shovels, but all their equipment is kept in perfect repair at all times, and it is this vigilance on their part, coupled with their capable and loyal organization, which makes that statement possible.

Incidentally Mr. Vandenberg has recently attached himself another, and we are sure, a much quieter partner than Mr. Schrader, in the person of Mrs. Clarence Vandenberg and to them we extend our sincere wishes for many happy and prosperous years.

"She's a honey!" exclaimed Jack Schrader, as the new 1¼-yard Gas+Air easily piled a heaping load of dirt into the 5-yard Mack in four swift passes.

AT THE close of the 1931 road building season according to the Portland Cement Association, about 11,400 miles of concrete rural roads were added to the 80,000 miles already built.

MEET

Mr. Average Excavating Contractor

States of Missouri, Kansas, Iowa and Nebraska

THE accompanying statistical picture of Mr. Average Excavating Contractor in the States of Iowa, Missouri, Kansas and Nebraska is compiled from replies to a questionnaire recently forwarded by The Excavating Engineer to the 1,041 contractor-readers in these four states. Replies from over twenty percent were received and used in preparing the averages.

Information is being collected on other groups of states and will be published in coming issues.

"Thank you" to all who have so kindly prepared estimates of equipment owned and other information.

A RECENT survey made by The Excavating Engineer indicates Mr. Average Contractor Reader in the above states uses 32,687 gallons of gasoline, 1,513 gallons of lubricating oil per year. He owns one and three fourths shovels-draglines-clamshells-cranes. Trucks are most popular for hauling, four out of every five contractors using this type of hauling. Sixty-five percent of contractors who use trucks for hauling own their own; thirty-five percent haul with hired trucks. The average fleet among contractors using this hauling method is 4.4 trucks; the average trucks for all contractors is 2.3.

Every hundred Average Contractor-Readers in these four states own:

111	Air Compressors	70	Lighting plants, electric
44	Batchers	11	Loaders, excavating
48	Bins	24	Locomotives, gasoline
79	Buckets, Clamshell	57	Locomotives, steam
26	Bulldozers	191	Mixers, concrete
361	Cars	30	Pavers
37	Conveyors	58	Piledrivers
21	Crushers	296	Pumps
17	Ditchers	61	Rollers, road
58	Drills, blast hole	106	Scrapers, tractor drawn
196	Drills, jackhammer	4311	Shovels, hand
47	Graders, elevating	708	Torches, Kerosene
35	Graders, power operated	279	Tractors
95	Graders, tractor drawn	44	Trailers, heavy duty
112	Hoists	143	Welding outfits
1606	Lanterns, Kerosene	133	Wagons, dump, trac. drawn
108	Lights, acetylene	22	Wagons, dump, trac. mounted

Ruston-Bucyrus Type "1030 ¾-cubic yard Diesel dragline mounted on wide caterpillar type mounting working on new Rotterdam-Hague Highway.

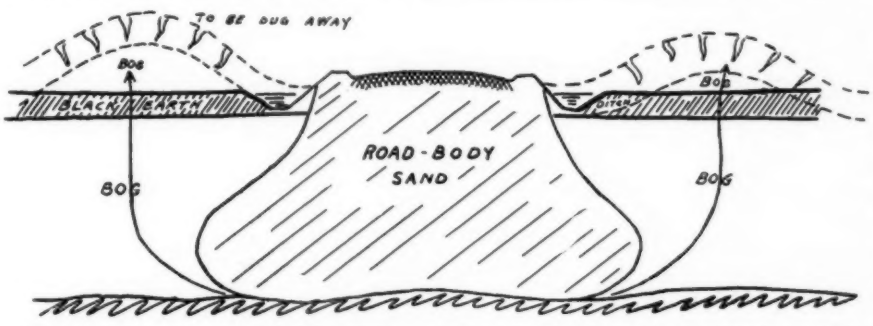
Roadbuilding in Holland

AMSTERDAMSCHE BALLAST MASTCHAPPIJ, well known Dutch excavating specialists who own many excavators, including Bucyrus-Erie, Ruston-Bucyrus, P. & H. and Northwest, are working on the new arterial motor-road which is to run practically in a straight line from Rotterdam to the Hauge.

This roadway will pass through typical Dutch meadowland with drainage ditches and canals which make its construction full of difficulties. The top soil itself is very soft and consists only of a thin layer of black earth under which is bog sometimes to a depth of 20 metres (65 feet), but generally 8 to 10 metres. Consequently for every square metre of road surface between 10 and 12 cubic metres of material must be excavated and dumped before a proper foundation is reached. The accompanying sketch will illustrate these difficult conditions and it shows how the weight of the road displaces the bog and causes the meadowland on each side to heap up, filling the ditches and canals.

The Ruston-Bucyrus Type "1030" shown in the accompanying illustration is at present engaged in removing the "side-swell" and is loading into wagons to be hauled to a dump.

The main body of the road is composed of river sand which is excavated by means of bucket dredges. The sand is taken from the barges by means of a fixed elevator which loads into trains and these dump into the roadway from which the bog has already been removed. A thick layer of stone averaging about 6 inches in size is placed on top of the sand and rolled in by steam rollers. Then comes a layer of smaller crushed stone and grit which is finally covered either with asphalt or with bricks which are made from local river clay.



Sketch showing how the sand road body, resting on virgin hard soil, spreads out due to the swelling action of the bog.

We are indebted to Messrs. Wynmalen & Hausmann of Rotterdam, machinery agents, for this information which they furnished in the belief that it would be interesting to contractors in other parts of the world to know something of the difficulties encountered in constructing roads in Holland.

FIELD NOTES

Not Exactly a Bachelor's Idea, Either

THE BUTTON holes in heavy outdoor coats and jackets are often suddenly discovered worn and so big the buttons will not stay fastened. A clever wife with a ready needle is the remedy, but only too often such blessings are far from being in the picture as they say. If you can however get a small rubber band, loop it under the button, pull the button through the hole and loop the rest of the band over the button again as shown by the lower one in the photo. This will keep the button nicely in place, and the coat snugly around you. A button so fixed will stay in place in a hole you can put your fist through. A handy one for this little winter time aggravation.

—Frank W. Bentley, Jr.

Classifying Excavated Materials

THE DIFFICULTY that was encountered in "Pigs is Pigs," in classifying guinea pigs was no greater than is often encountered in the courts in determining to what class certain materials belong under an excavation contract.

Such a question was before the Minnesota Supreme Court in the case of Foley Brothers v. St. Louis County, 197 N. W. 763. The contract in question provided:

"Earth shall include all sand, clay, gravel and other material of every description, as found which are not included in the following classification of loose and solid rock.

"Loose rock shall include all slate, shale or other rock which cannot be plowed with a 10-inch road plow and four-horse team, but which can be quarried or loosed with a pick without blasting to facilitate the work; also all detached rock or boulders measuring not more than one-half cubic yard each.

"Solid rock shall include all rock in masses, which cannot be loosened with a pick, also all detachable rock or boulders measuring not less than one-half cubic yard each."

It was held by the court that where ground was so infested with boulders that it was impracticable to plow it, the whole mass so filled with boulders should be classed as loose rock; and that a very hard substance, composed of silica and clay, which could neither be practically plowed nor picked, and had to be blasted, was classifiable as "solid rock."

—A. L. H. Street

Could One of These Accidents Happen on Your Job?

INDUSTRY has made tremendous strides in accident prevention through organized effort toward removing unnecessary hazards. In the industry of excavation most mines and quarries have given particular attention to the problem of safety. Because of their less permanent organizations, and comparatively short term of jobs, contractors as a rule have probably given less attention to this question than it deserves.

Here is a report from the monthly news letter of the Construction Section, National Safety Council, which emphasizes the need of special effort in this respect.

1. NATURE OF ACCIDENT..... Stone setter received a fatal skull fracture due to a stone setting derrick tipping over.
The derrick was built of a cross timber for base, with a single upright at the top of which was a pulley through which hold back lines ran. A truck delivering stone backed over one end of a heavy plank under the derrick base, kicking the base loose.

RECOMMENDATIONS ..... This case did not involve the derrick, which is considered safe for its purpose, nor the stone setter himself, who was justified in being at his post, but pointed toward better control of trucking in limited space.

2. NATURE OF ACCIDENT ..... Between the 10th and 11th floors two landings had been poured to allow for three short flights of stairs. Stairs were not yet in place so short ladders (about six feet) had been set up by subcontractors temporarily.
The stairwell adjoined an elevator shaft and two pieces 1x6 had been set horizontally as a guard to the shaft.
A heavy set man coming down one ladder, which was nearly vertical, apparently tipped backward, breaking the lower 1x6, and fell into the elevator shaft with fatal results.

RECOMMENDATIONS ..... That use of stairways or ladders be discontinued under such circumstances and that in any event heavier guard rails be used.
Anchor the top of ladders if they must be used.

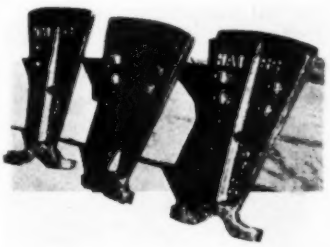
3. NATURE OF ACCIDENT..... At shop two mechanics were repairing a truck, washing bearings in gasoline. A small blow torch was being heated to expand on axle and cup, to allow removal of the cup.
A pull of wind blew gasoline fumes to the torch igniting the gasoline. One mechanic grabbed the gasoline pan to take it out but was compelled to set it on the concrete floor. An ice cream vendor had come into the shop, even though he had been warned to stay out and at that moment ran into the two others and clothing of the three caught fire. The two mechanics kept cool and put out their clothing but the vendor ran fanning the flames and was very seriously burned.

RECOMMENDATIONS ..... First, that kerosene be used exclusively for cleaning machinery, and second, that the rule against allowing outsiders in the shop be rigidly enforced, except where essential to the business.

EQUIPMENT YOU OUGHT TO KNOW ABOUT

Haiss Renewable Paddle Blade Tips

WHILE the introduction of Manganese steel has gone a long way toward lengthening the life of bucket loader wearing parts, the service to which the feeding paddles on the Haiss type machine are subjected, causes continuous gradual wear. This slow abrasion at the tip of the paddle eventually causes a shortening of its length to a point where it fails to dig quite as deep as the leading edge of the buckets on the elevator chain.

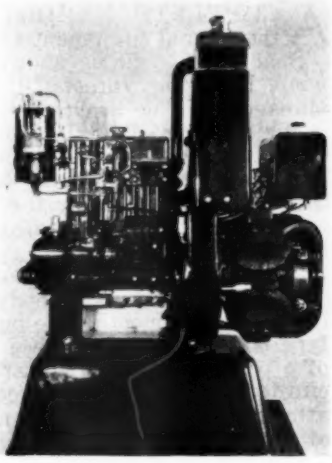


Rather than subject the machine user to the necessity of renewing the entire heavy manganese casting the *George Haiss Manufacturing Company*, 114th St., and Rider Ave., New York, is equipping the Haiss Excavator and its series of heavy duty loaders with paddles to which can be bolted renewable tips. This inexpensive repair restores the paddles to full length and can be repeated as often as necessary. Additional information will gladly be sent you upon request.

Kohler Shows Cutaway Plant

A SPECIAL cutaway model showing the construction and operation of Kohler electric plants and emphasizing their adaptability to all kinds of outdoor building will be the center of interest in the *Kohler of Kohler* exhibit at the Road Show—Space 447.

In this special display plant there have been cut away sections of the vacum tank shell, gear cover, cylinder head, cylinder block, governor housing, generator housing and oil base, exposing effectively the direct-connected generator, the large crankshaft and connecting rods and the compactness and durability of design that makes 1½ and 2 K. W. Kohler models particularly suitable for use by road builders, construction and excavating contractors and others engaged in outdoor work.



Making steady electric current available where city power lines do not and cannot reach, Kohler plants provide powerful floodlights that enable night shifts to continue the work after dark. In this way 24-hour operation of construction equipment is possible and more jobs can be handled every season.

Sturdy and self-contained, these plants may be mounted on excavators, draglines, dredges, ditchers, cranes, engines, derricks, shovels, concrete mixers, pavers and other apparatus. In addition to furnishing current for floodlighting, which illuminates the entire working area as bright as day, they operate power equipment, such as motors, pumps, air compressors, lathes, saws, drills and other portable electric tools.

A model EH Kohler that carries its house with it also will be displayed at the 1932 Road Show. Bart Downey, manager of the Detroit branch of the Kohler company, will be in charge of the exhibit.

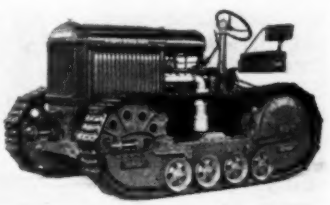
"Hercules" Rope Samples to Be Shown

SAMPLES of Hercules (Red Strand) Wire Rope which is manufactured by *A. Leschen & Sons Rope Company, St. Louis,* for use on different types of road building machinery will be exhibited in Detroit this month. Messrs. E. J. Schillinger, E. E. Hickok and Wm. Berminger will represent Leschen & Sons Rope Company at the exposition. Space 309.

Trackson Exhibit

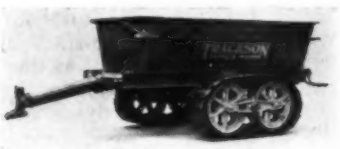
THE EXHIBIT of *Trackson Company, Milwaukee, Wis.*, at the Road Show, Space 237, will include three principal units manufactured.

Model GH Trackson McCormick-Deering Crawler-Tractor. Equipped with Model G heavy-duty Trackson Crawlers, the Model 20 McCormick-Deering is made adaptable to a wide range of industrial uses wherever sure-footed traction is necessary. Clean-cut, open design, with wide clearances between crawlers and motor, permits quick and secure attachment of such auxiliary pieces as the Trackson High Shovel, Low Shovel, Bulldozer, etc., and various attachments of other makes. It also permits quicker and easier lubrication and adjustment. Simplicity is the keynote—a minimum of moving parts, with each part performing its function in the simplest possible way. Track shoes are cast in one piece, without parts to wear and loosen, and of greater length than the usual type of shoe, which means fewer hinges and shoes to each crawler track. Smooth corrugations of the shoes grip securely, yet do no damage to road surfaces. Simple handwheel steering is another notable feature. The crawlers are of rigid frame construction, so necessary to rugged industrial service, especially where attachments are used. Extra-heavy truck wheels



and bearings are provided to allow a wide safety margin for the great super-imposed loads and strains of auxiliary equipment. Note particularly that the motor unit does not protrude ahead of the crawlers but is centered fore and aft between them. This, together with the wide spacing of the crawlers, effects proper balance for the operation of front, side and rear-end equipment. The track shoes and drive sprockets are readily reversible for extra wear and practically double-life.

Trackson Crawler Wagons. Here are wagons that have mechanical features which are indispensable to steady profits. Parts that invariably wear and cause lay-offs are made so that they can be replaced easily and quickly. Proper adjustment, which means so much to the easy running and long life of such equipment, can be made without dismantling and in the least possible time. Strength is secured without excess weight, and design sensibly provides for the actual conditions to be met. The Trackson Wagon has a loading height of only 61½" without the flareboard. It is of all steel construction yet weighs only 10,000 lbs. An armored top and cast steel headers at the front and rear make it amply rugged to withstand the whacks and bangs of tough service. The tongue is a rigid tube, for greatest strength, and incloses a sturdy spring drawbar which is fully protected from dust and dirt. A single lever dumps and winds up the heavy plate doors which close uniformly tight because of a special cable equalizer. The crawler wheels are extremely simple and rugged. Fewer moving parts make them easier running and freer from wear. The shoe bushings and pins are easily renewed when worn, also the all-important tension members which maintain camber in the tracks and keep the wheels easy running. Both Trackson Crawler Wheels and Wagons are built on a production basis which assures that replacement parts will fit when received.



Trackson High Shovel. For fill-in or clean-up work, for building shoulders and covering fresh concrete, for moving slides or cutting off points to increase sight distance, for loading snow or surplus dirt, and for dozens of similar operations the Trackson High Shovel effects many economies. It is plenty husky for the heavy jobs, easily excavating from 30 to 50 yards per hour, yet is compact and fast enough to work on busy roads without blocking traffic. It gets into operation quickly, handles easily, and works in any soil without getting stuck. In new road construction it has been found especially valuable in cutting to grade and removing surplus dirt between the forms, dumping it into trucks or out over the shoulder. The bucket is of ¼" steel plate, reinforced by ½" x 6" plow steel cutting edge, the bucket seats are extra heavy high carbon steel. The lifting arms are heavy 4" H beams, securely reinforced. The main side frames which absorb the digging and hoisting strains are ¾" x 9" bar steel.

FWD to Show Two New Models

TWO FWD trucks will be exhibited at the Road Show—Space 211— by the *Four Wheel Drive Sales Co., Clintonville, Wis.* The models to be shown will be a new and more powerful HH6 of 2½ tons and the 1932 six wheel job of six tons capacity.

The new HH6 is featured especially as a road building and maintaining machine. It will be equipped with dump body and hoist, also the latest type power controlled underbody scraper. A powerful motor developing 85 brake horsepower hooked up to all four wheels through a seven speed transmission insures the unusual in performance.

The X6 model is a four wheel drive six wheeler employing the regular FWD drive, that is, a live front axle and first rear axle with a dead second rear axle. This new truck is greatly improved in appearance over former models and has a number of mechanical improvements as well. The motor and transmission have been lowered considerably making an almost straight line drive between the transfer case and two driving axles. Motor power has been increased with heavier units incorporated all along the driving line. Balloon tires of the 10.50-20 size will be used on all six wheels. The low mounted coupe type cab is completely equipped with all the comforts of a pleasure car including a unit instrument panel indirectly lighted.

In addition to the FWD trucks exhibited by the Four Wheel Drive Sales Company there will be another interesting FWD at the show. A hydraulic controlled Wausau snow plow is being exhibited by the Wausau Iron Works on the 7½ ton M7 model.

Hug Company to Have Complete Exhibit

A COMPLETE EXHIBIT of its Roadbuilder trucks and equipment at the 1932 Road Show —Space 226—will be shown by *The Hug Company, Highland, Illinois.* R. K. Tibbetts, General Manager, will be in charge of the exhibit shown.

Models 60 and 82 Roadbuilder trucks will be shown and in addition, the Company will exhibit for the first time the new Hug Agitator Body, a body designed especially for the transportation of wet concrete and which will be mounted on an 87K Hug Roadbuilder chassis.

The Hug Agitator Body consists of an open top, cylindrical steel tank or body, the inside walls being perfectly smooth. The body is not a revolving type body but can be raised or lowered by means of a power hoist. The agitation of the concrete is effected by four spring blades, these blades being attached to a shaft that runs through the center of the body, the shaft rotating four spring blades through the concrete. The power used to drive the

spring blade agitator is furnished by a 3-H.P. independent motor attached to the side of the body. The advantage of the spring blade is that due to the spring action in the blade, the blade continually cleans the sides of the body and there is no possible chance for any accumulation of material to the sides.

The Hug Agitator Body is furnished in 2 and 3 cubic yard capacities. The body is also equipped with a special discharge gate making is possible to discharge a partial load of any desired quantity. The discharge gate is water-tight and by the operation of a simple lever the amount of the concrete discharged can be increased or decreased and immediately cut off.

Standard models of the subgrading machine and subgrade template will also be on exhibit.

Many Improvements in Bucyrus-Erie Complete Line Seen in 1931

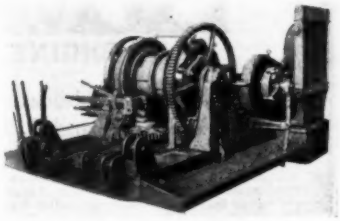
NEVER BEFORE have the users of excavating equipment been confronted with such an imperative need for developments in their machinery to attain the lowest possible costs per yard. Keenly aware of the situation confronting contractors and other dirt movers, *Bucyrus-Erie Company, South Milwaukee, Wisconsin,* has pushed its development work during 1931 to the limit. A large number of completely new machines along with many improvements in older models are the result. Increased yardage with reduced operating expense has been the keynote in designing this new and complete line.

Early in January the company introduced a new 3-yard Diesel dragline, shown here, a machine of medium size with full air control and the ability to move with extreme ease and safety across soft ground.

A little later was announced the purchase by Bucyrus-Erie Company of a controlling interest in the Monighan Manufacturing Corporation of Chicago, manufacturers of walking dragline excavators. Following this the company took over the "Loadmaster"—a portable gasoline crane with a full revolving boom and the ability to go and work almost any place an automobile can be driven.

In the spring of the year four new convertible excavators were announced. These machines are all closely similar; the difference being one of size. Each one is available with gasoline, Diesel or electric power. Each one has a most unusual collection of modern, money saving features. They are 43-B, 1½-1¾-yard; 37-B, 1¼-1½-yard; 32-B, 1-yard and and 21-B ¾-yard. The illustration below shows the rugged simplicity of design, the easy accessibility of all machinery, and the handy location of operating levers.

There was also announced a new 1¼-yard Gas+Air machine. This machine has a gasoline engine as a prime mover but uses air for the swing and crowd motions.



Two new quarry shovels were introduced; the 52-B machine 2¼-yard electric machine and the 42-B electric—a 1¼-yard machine. These two shovels are constructed for use as draglines, clamshells or lifting cranes, but they are designed primarily for use in small and medium size quarries.

Earlier in the year Bucyrus-Erie Company introduced an improved type of Tower Excavator, a piece of equipment which has found extensive use on the Mississippi Flood Control.

Another major development, announced in 1931, is the new 18-yard stripping shovel, a machine which weighs over one-thousand tons—two million pounds—and finds its most extensive use in the strip mining of coal.

Two of the most unusual developments of the year were a counterbalanced hoist for stripping shovels and aluminum booms for dragline excavators. By means of the hoist counterbalance large stripping shovels may be made to show an increase in operating speed, a decrease in power consumption and a lower overall cost per yard of material used.

Shunk Exhibits Many Products

IN THE Road Show exhibit at Space 238 of *Shunk Manufacturing Company, Bucyrus, Ohio,* will be found:

Road grader blades, scarifier and rooter teeth
Shunk metal traffic markers and Bradley rubber markers and letters for pavements
Camel dump wagon
Meyer auto snow plow.

In addition to the products listed above, the Success Maintainer and the Topping Pony Ditcher are also manufactured by this exhibitor.

Models to Feature Sauerman Exhibit

FEATURES of the Sauerman exhibit at the 1932 Road Show — Space 135 — will include: (1.) Power-operated models of Sauerman slackline cable way excavator and "Crescent" drag scraper showing the modern processes of excavating sand and gravel from stream-beds, pits and banks and of stock-piling and rehandling concrete aggregate; (2.) A hand-operated model of a crawler crane rigged up with a "Crescent" scraper bucket, illustrating how this hook-up increases the reach of the crane a distance of several hundred feet; (3.) A hand-operated model of an improved type of conveying cableway designed by Sauerman engineers for handling loads of 1 to 20 tons; and (4.) In addition to the models, some of the actual equipment will be displayed, including a "Crescent" scraper bucket and several "Durolite" steel drag-

(Continued on Page 30)

THE EXCAVATING ENGINEER
FOUNDED 1905

A Monthly Publication Devoted to Excavating and Allied Subjects

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THE EXCAVATING ENGINEER PUBLISHING CO.
F. O. Wyse, Managing Editor—Arnold Andrews, Editor
E. M. Heuston, Advertising Manager.
South Milwaukee, Wisconsin
Printed in U. S. A.

The Business Situation

IN THE COURSE of our reading and study during the past month, one particular business comment has stood out so strongly as remarkably well thought out and unusually well written that we limit ourselves in this column to a reprinting of it. The following is an excerpt from the *Business Bulletin* of the *Cleveland Trust Company*, dated December 15, 1931.

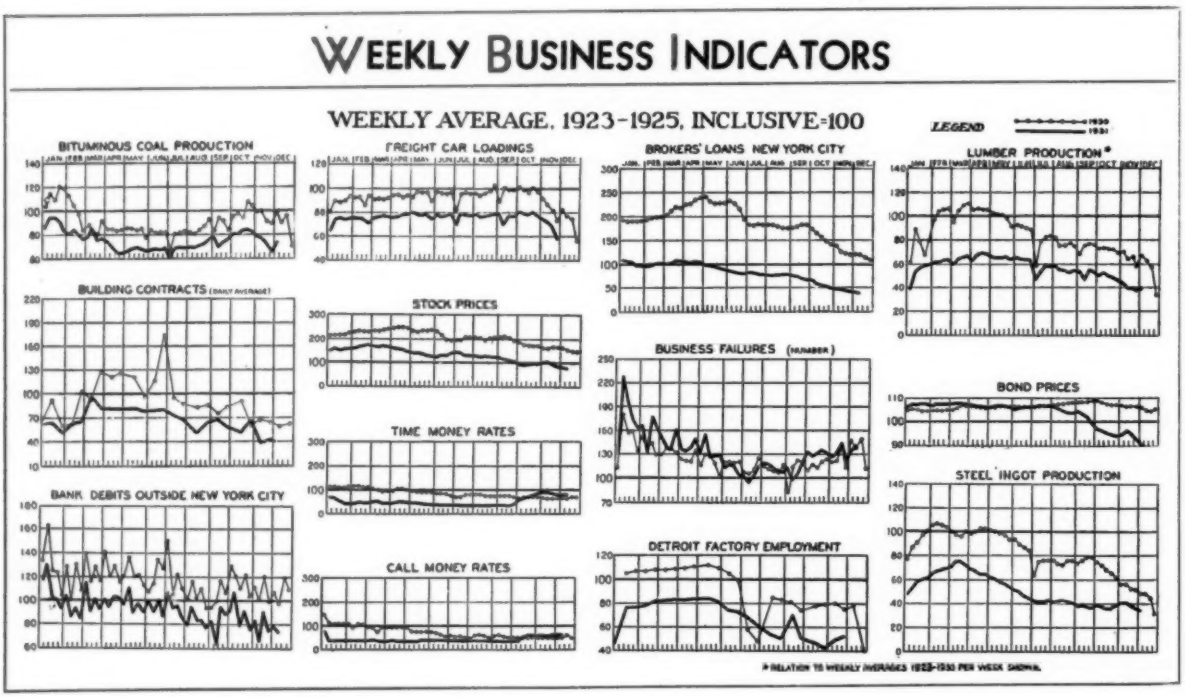
"During the past two years the general levels of wholesale prices have dropped both here and abroad by about one-third, and have fallen to their pre-war figures. The result is that business relationships and procedures all over the world have been disrupted and partly paralyzed. As business everywhere slowed down, the banks began to feel the pressure of curtailed activity. Credit was contracted by the paying down of business loans, and bank profits were reduced. For a time these developments were not serious, but soon bankers began to realize that trade advances that had been amply secured by the pledge of marketable commodities were no longer so fully protected when the market value of those commodities was rapidly falling. As the banks brought to bear increasing pressure for the payment of such loans the prices of commodites fell still further and faster.

"Then followed a long procession of declines in the market values of other things in which banks everywhere were financially interested. If agricultural commodities were worth less than they had been a short time before, then the farms that produced them were worth less, and farm mortgages were not so secure. As the products of mines declined in value, the stocks and bonds of mining companies became less desirable, and the loans made by banks on such securities were not so safely protected. As manufactured articles fell in price, industrial stocks and bonds declined, and successive payments were demanded by banks on loans secured by such collateral. As the volume of trade declined similar pressure was brought against securities of shipping and railroad companies.

"During much of this year the banks of this country, and of all countries, have been engaged in a race for liquidity. As the prices of commodities continued to sink, as stock prices fell, and as the values of real estate shrank, the banks have been calling upon their customers to make payments on their loans. Some banks moved in these matters less promptly and less vigorously than others. Soon bankers began to realize that the institutions which were failing were largely those that had followed a lenient policy toward their borrowers until collateral values had fallen so low that the loans could not be paid. In banking parlance the loans were frozen.

The resulting tendency was for every alert banker to resolve to protect his institution and his depositors from the hazards of holding frozen assets, and to do it by getting into the most liquid condition possible. The way to get liquid was to get

WEEKLY BUSINESS INDICATORS



borrowers to make payments on their loans, and in order to do this many borrowers had to sell securities that had been deposited with the banks as collateral for the loans. Each new wave of selling carried market prices further down, and each new decline in market prices reduced the value of collateral behind other loans and called for further sales. This was a vicious circle of deflation that caused deflation. The individual institution had no choice but to follow the policy of liquidity. It was good banking in each separate case, for it protected the bank and its depositors, but its general results tended to defer business recovery.

"There has been an immense contraction of credit. Loans and investments of banks suffered a shrinkage in the depression of 1921 amounting to something less than five billion dollars. In this depression the bank shrinkage plus that of brokers loans from other sources has already amounted to 11 billions. Moreover the floating of new bond issues which furnish the funds for new construction and equipment has almost ceased. In October new bond issues totaled 28 million dollars, which is the lowest monthly amount of which we have any record. It is not surprising that industrial production in this country has fallen to a level 37 per cent below normal which is a more drastic decline than we have ever experienced in any previous depression.

"Custom sanctions attempts at this time of the year to forecast probable business developments of the new year. This time it seems possible to make such forecasts only within closely restricted limits. This depression and this business cycle are so exceptional in character in so many diverse respects as to make it quite unsafe to assume that serious forecasts can be made concerning such concrete matters as the output of automobiles, the production of steel, the volume of new construction, and the probable trend of security prices. There still remain too many unsettled situations abroad that are highly important, darkly obscure, and thoroughly unpredictable.

"It does seem probable that a year from now industrial production, railroad loadings, and factory employment will be recorded in greater volumes than they are at present. Gold exports will probably be smaller, money in circulation less, and bank failures fewer in 1932 than this year. Commercial failures will probably be more numerous. Dividend payments are likely to be less, and the cost of living and the average earnings of industrial and railroad employees lower. Among series likely to advance may be included brokers loans, and the production of electric power."

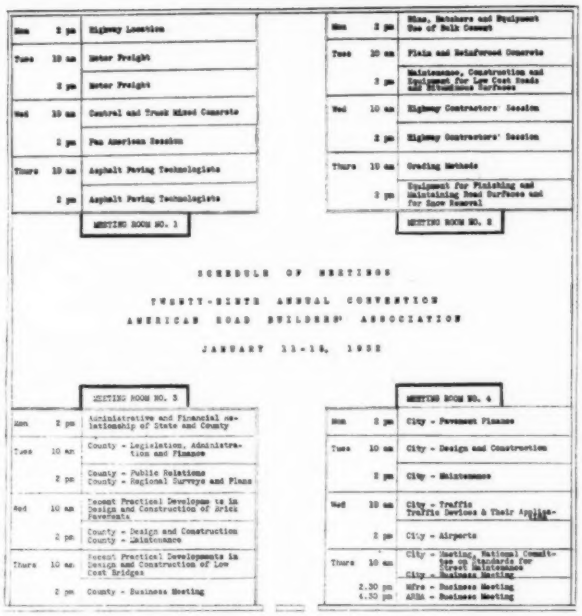
JANUARY CONVENTIONS

American Road Builders' Association
Convention and 1932 Road Show
Detroit Municipal Airport Building
January 9-15, 1932 — *Detroit, Michigan*

National Crushed Stone Association
15th Annual Convention and Exposition
Hotel William Penn
January 19-22, 1932 — *Pittsburgh, Penna.*

National Sand and Gravel Association
16th Annual Convention and Exposition
Hotel William Penn
January 27-29, 1932 — *Pittsburgh, Penna.*

Where and When Road Builders Meet



SCHEDULE OF MEETINGS
TWENTY-NINTH ANNUAL CONVENTION
AMERICAN ROAD BUILDERS' ASSOCIATION
JANUARY 11-15, 1932

MEETING ROOM NO. 1

Mon	2 pm	Highway Location
Tues	10 am	Motor Freight
	2 pm	Motor Freight
Wed	10 am	Central and Truck Mixed Concrete
	2 pm	Pan American Session
Thurs	10 am	Asphalt Paving Technologists
	2 pm	Asphalt Paving Technologists

MEETING ROOM NO. 2

Mon	2 pm	Mixes, Batchers and Equipment Use of Bulk Cement
Tues	10 am	Plain and Reinforced Concrete
	2 pm	Maintenance, Construction and Equipment for Low Cost Roads and Bituminous Surfaces
Wed	10 am	Highway Contractors' Session
	2 pm	Highway Contractors' Session
Thurs	10 am	Grading Methods
	2 pm	Equipment for Finishing and Maintaining Road Surfaces and for Snow Removal

MEETING ROOM NO. 3

Mon	2 pm	Administrative and Financial relationship of State and County
Tues	10 am	County - Legislation, Administration and Finance
	2 pm	County - Public Relations County - Regional Surveys and Plans
Wed	10 am	Recent Practical Developments in Design and Construction of Brick Pavements
	2 pm	County - Design and Construction County - Maintenance
Thurs	10 am	Recent Practical Developments in Design and Construction of Low Cost Bridges
	2 pm	County - Business Meeting

MEETING ROOM NO. 4

Mon	2 pm	City - Pavement Finance
Tues	10 am	City - Design and Construction
	2 pm	City - Maintenance
Wed	10 am	City - Traffic Traffic Devices & Their Application
	2 pm	City - Airports
Thurs	10 am	City - Meeting, National Committee on Standards for Street Maintenance City - Business Meeting
	2.30 pm	NPre - Business Meeting
	4.30 pm	ARBA - Business Meeting

THE SCHEDULE of meetings for the 29th Annual Convention of the American Road Builders' Association is shown above in handy form for ready reference.

Our Front Cover

THE BEAUTIFUL road building picture reproduced this month on our front cover shows a portion of the work the progressive French contractors, Entreprise Burdillat Aine & Company of Montceau-les-Mines, France, have underway in the French Alps.

Despite the beauty of the surrounding country, road building here is, at best, difficult work. When the Gas+Air shovel was ready to move onto the work it was necessary to help prepare the road to the section which Entreprise Budillot was to construct. The Gas+Air shovel assisted in this work of opening a trial to their own work.

Excavation in this mountainous country is, of course, very largely solid rock and side casting disposes of a good deal of the material. Much of the work is alongside steep slopes or cliffs and the machine started work alongside a drop of about 150 feet just over the edge of the road. The machine is operated by two French mechanics who soon became very proficient in handling the controls. The air compressor on the machine has been used to good advantage for furnishing air used in rock drilling. The Wisconsin 6 cylinder 5¾x6½ engine is equipped for operating at high altitudes, some of the work being at an elevation of about 9000 feet.

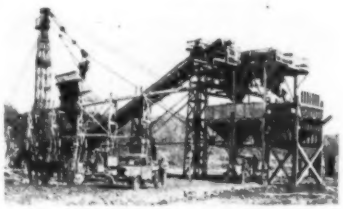
The Gas+Air has performed very satisfactorily on this heavy work and the entire Burdillat organization is enthusiastic about the machine.

Equipment You Ought to Know About

(Continued from Page 27)

line blocks ranging in size from 6″ in diameter up to 30″ in diameter.

The first of these exhibits mentioned above, the slackline cableway excavator, is operated by either an electric or gasoline hoist, the choice of power being governed by local conditions. This plant now used by many paving contractors to produce concrete aggregates is of all steel construction and can be knocked down, transported and re-erected at a new location with a minimum of effort and expense.



A one cubic yard Sauerman excavator, with an operating radius of 500 feet and a handling capacity of 60 tons per hour, is the most popular size of excavating unit for these semi-portable plants, but smaller or larger Sauerman machines also are used, depending upon the amount of aggregate the contract calls for per day.

The illustration above shows this contractor's semi-portable gravel plant on a paving job. Gravel is delivered by the cableway to a steel hopper feeding a crusher. Inclined belt conveyor runs from crusher to screens on top of steel bin.

In charge of this exhibit will be D. D. Guilfoil, Sales Manager. Sauerman exhibits at the Crushed Stone Convention and at the Sand and Gravel Convention will be much the same as the above. *Sauerman Bros., Inc.* are located at 476 S. Clinton St., Chicago.

Wood Hydraulic Hoist and Body Exhibits

FOR the American Road Builders' Association Convention and Exposition the *Wood Hydraulic Hoist & Body Company, Detroit,* plans an exhibit to occupy a thousand square feet of space for the following: full size operating models of the D6, C12, F4C, W12 hoists; miniature working models of the mechanical hi-lift; a cased exhibit of the mechanical hoist; and two tables of parts displays. Throughout the convention period the company will maintain open house to out of the city visitors, at its Detroit plants. Space 307.

Blaw-Knox at the Road Show

EQUIPMENT to be displayed in Space 119 at the Road Show by *Blaw-Knox Company, Pittsburgh,* will include the following: "Ateco" Hydraulic Scraper; Clamshell Buckets; Aggregate Weighing Batcher; Cement Weighing Batcher; Improved Ord Finisher with 4-cylinder motor. This will be a 9-10 ft. adjustable machine equipped with double screed and tamper; and Road Forms showing a complete range of types and sizes. Also Street and Sidewalk Forms.

The Blaw-Knox booth will be complete with its exhibit of the equipment listed above and a pictorial display illustrative and descriptive of the complete Blaw-Knox line of batcherplants, bulk cement plants, Trukmixers, agitator-truck bodies, ready mixed concrete plants, Ord asphalt finishers, truck turntables, Cement tanks, wagon graders, dragline buckets, tamping rollers, scarifiers, and bulldozers.

Young Radiators Exhibited

THE *Young Radiator Company, Racine, Wisconsin,* announces that it will have on exhibition at Space 230 at the Road Show in Detroit, a number of newer products of general interest to the user of heat transfer apparatus.

Among the items to be shown will be new developments in heating cores both for convection heating and unit heating service, also new developments in cooling for both gas and Diesel engines and for both water and oil cooling.

The Company will be represented by F. M. Young, President, J. J. Hilt, Sales Manager and Wm. L. Walton, Sales Engineer.

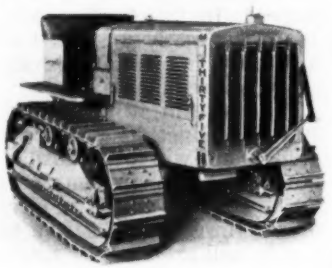
Broderick & Bascom "Flex-Set" Pre-formed Rope

ACCORDING to a recent announcement, *Broderick and Bascom Rope Company, 4203 N. Union Blvd., St. Louis, Missouri* is now manufacturing "Flex-Set" Pre-formed wire rope. This rope, having all the qualities of the regular B. & B. rope, found instant popularity with wire rope users, in fact, the demand proved far beyond expectations, says the manufacturer.

In pre-formed rope the strands and wires themselves are "pre-formed" into a helix so that they fit snugly into the completed rope, producing a rope that is free from internal stress, is easily handled, easy to install, spools evenly on the drum, is not as apt to kink as ordinary construction and is giving exceptionally good service on excavating machinery.

New "Thirty-five" Caterpillar

HERE is a picture of the newest "Caterpillar" Tractor, the fourth new model announced this year — the High Clearance Ten, the Diesel, the Fifty and now the Thirty-Five.



In reviewing the year, we find other advanced engineering products developed and announced by *Caterpillar Tractor Co., Peoria, Illinois,* include: 3-row Planter, 3-row Cultivator, Mower (For Ten or Fifteen), Bean Combined Harvester, Multiple Implement Hitch, Terracer, Auto Patrol, Auto Patrol Snow Plow, Power Lift—Planter, Power Lift—Trailer, and the Twenty and Thirty Leaning Wheel Graders.

Anthony Hoists and Bodies

NEW and outstanding achievements and features in hydraulic hoists and bodies will be shown in the Anthony Company's exhibit at the Road Show —Space 246.

The shaker or muck remover, which is incorporated in all Anthony pipeless hydraulic hoists will be shown and demonstrated. The shaker, an exclusive Anthony feature, is automatic and operates when the body reaches full dumped position, shaking to dislodge sticky or clinging loads. The degree of shake is controlled by the driver through the motor speed. The Shaker was de-

(Continued on Page 59)

Thanks to Harry Craig,

Allegany County Builds Highways with a Systematic Plan

(Continued from Page 20)

greatest service to the greatest number. His plan, or system, was filed with the state highway officials and approved without alteration.

Quality Construction Means Reduced Maintenance

In construction, Mr. Craig plans by careful engineering and quality of work to cut down future maintenance to a minimum. He plans the projects so that they will fit his small organization and keep them busy every working day in an orderly, systematic manner during the brief working season—approximately from April 15th to October 15th.

The earth handling for any project is carefully plotted in advance and the foreman on each job is furnished with a plan which shows in detail where the earth is to be moved. In reconstructing old routes in this typography where the custom of bygone days was to follow contour, a large percentage of the curves are eliminated or improved and cuts

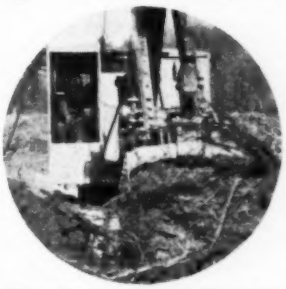
A service truck with grease and oil visits every piece of equipment in the field once each week, checks it over, and gives it a complete greasing.

and fills are made to provide, so far as possible, gentle grades. A careful system has been worked out in preparing plans for each project so that cuts balance nearby fills, that is, that the earth removed from the cuts is sufficient to fill depressions within a few hundred feet so that long, expensive hauls are eliminated.

Buy the Best Equipment and Then Take Care of It, Mr. Craig's Policy

Mr. Craig's home and office is at Canaseraga, but his superintendent, Hal Talbett, directs field operations during the construction season. It is significant of the regard Mr. Craig has for the importance and value of good equipment and proper maintenance that Mr. Talbett's primary job is that of maintenance of equipment. Three men, besides Mr. Talbett, are employed in the shop at Friendship and in the field as needed the year around. One of these is a capable blacksmith who makes spreader boxes and other special items as needed, besides taking care of repairs.

Every piece of equipment is transported into the shop at Friendship in the fall for storage and complete overhaul during the winter. Mr. Talbett, himself, gives it rigid inspection and any part which looks as though it might give trouble during the next season is replaced. The result is that delays on account of trouble in the field are almost unknown. In five years there probably has not been a total of ten hours delay in work due to trouble with equipment. Mr. Craig never buys on a price basis, only takes on equipment which he knows is intelligently engineered and then he maintains it so that it will give a long lifetime of service without trouble. This policy has proven most economical and of fundamental importance in Mr. Craig's sixteen years of experience.



Dragging out the tangle of an old creek bed to provide better drainage and protect the new road.

The same shovel operators are kept on year after year. Herman Howes has the newest shovel, Carl Schneider regularly operates the Bucyrus-Erie steamer purchased in 1925, Thomas Talbett operates a Bay City gas type, three-eighths yard, bought two years ago, and Clifford Taylor operates the oldest Bucyrus-Erie, bought in 1924 and still working just as efficiently as it did the first year. The same policy is pursued with other men operating equipment; they are kept on as long as they care to stay and know how to get the most out of their equipment.

Competent engineering, experienced foremen, good equipment, properly maintained and operated, together with careful, continuous supervision are building good roads in Allegany County at a reasonable cost.

FROM December 1st, 1930, to December 7th, 1931, public and semi-public works contracts in the U. S. A. amounted to $2,775,562,000 according to the President's Organization on Unemployment Relief.

FIGURES compiled by the U. S. Bureau of Public Roads show a gasoline consumption of 7,118,000,000 gallons for the first half of 1931 as compared with 6,810,000,000 gallons for the first half of 1930. This is an increase of 2.3 per cent.

SHOTS FROM THE FIRING LINE

President Hoover Plans to Stimulate Home Building

ON November 13th President Hoover outlined a plan that he will present to Congress for the establishment of a system of home loan discount banks to release frozen mortgage loans on homes and farms and to promote a revival of home building.

Residential building, which reached a peak in 1925, gradually declined in the following years and dropped sharply from 1929 to 1931 according to the Bureau of Labor Statistics in 257 cities studied. 121.8 families in each 10,000 of population were provided with housing in the year of 1925 with only 56.0 in 1929 and 27.9 in 1930. For the first 10 months of 1931, according to F. W. Dodge Corporation, residential contracts awarded showed a decrease of 13% in floor space under 1930 indicating a further decline in house provision.

To remedy this situation President Hoover proposes that 12 home loan discount banks be established, one in each Federal Reserve district under the direction of the Federal Home Loan Board. Their capital is to be subscribed by building and loan associations and banks with possibly an initial government subscription if necessary. Further capital will be secured by the sale of bonds or notes to investors. Conservative loans may be made to subscribers upon their notes secured by mortgages limited to a maximum of $15,000. The plan is designed to assist in refinancing sound mortgages and in stimulating construction.

National Paving Brick Association to Meet in Chicago, February 10-12

THE twenty-sixth Annual Meeting of the National Paving Brick Association will be held at Chicago, Ill., February 10-11-12, 1932.

The program for the last two days will include papers and discussions of the latest practices in the design and construction of streets and highways, particularly the vitrified brick type. These sessions will be open to the general public and any one interested in street and highway development is invited to attend. George F. Schlesinger, formerly State Highway Director of Ohio, is Chief Engineer and Managing Director of the National Paving Brick Association.

13th National Convention of the Associated General Contractors of America

THE THIRTEENTH ANNUAL CONVENTION of the Associated General Contractors of America will be held in the City of Milwaukee, with headquarters at the Schroeder Hotel, between January 18 and 21, 1932. President A. P. Greensfelder of St. Louis, Missouri will preside.

The intensive work of the Association, with its headquarters staff at Washington, D. C. will be reviewed. Combined problems of normal and abnormal times will receive their impetus at the several sessions and started on the way to improving the Construction Industry. The National Association has been active in credit reform work, safety and skill among workmen, promoting free labor as against convict labor, establishing of a Bureau of Contract Information and furthering interests of the responsible contractor. It has joined hands with other National Associations in the Industry and is now prominent in the work of assisting and developing The Construction League of the United States which will act readily as a clearing house for the Industry at our National Capitol.

Speakers of National prominence and leaders in the Industry and its related workings will be on the Convention Program President Arthur Bentley of the Milwaukee Chapter has twelve committees serving to promote and entertain the delegates as well as their wives, sons and daughters. The leading industries of Milwaukee and the business men as well are lending their support to assure a successful convention and a most enjoyable time for all.

Highway Research Board Meeting

THE 11th annual meeting of the Highway Research Board of the Division of Engineering and Industrial Research, National Research Council, was held December 10th and 11th at Washington, D. C. The sessions were devoted to discussions of reports of research activities in relation to the developments of highway financing, transportation, design, materials, construction, maintenance and traffic. For information on any of these reports address Roy W. Crum, Director, Highway Research Board, Washington, D. C.

Government to Drill Alaskan Coal

THE Department of the Interior in its endeavor more definitely to determine the extent of coal deposits in Alaska is calling for bids for the drilling of four core holes in the anthracite ridge basin in the south central part of that Territory. This drilling is supplementary to an investigation of mineral resources in Alaska, authorized by the last Congress and prosecuted during last summer by the Geological Survey. The cores to be taken out will be to a depth of 1,500 to 2,000 feet and will show the thickness of coal deposits in this promising area. Bids for the work which is to be done during the coming season will be opened at the Department of the Interior on January 15, next.

Scenic Highway to Connect North and South Rims of Grand Canyon

IMPROVED motor transportation between the North and South Rims of the Grand Canyon was assured today when Ray Lyman Wilbur, Secretary of the Interior, announced the award of a $145,000 road-construction contract to Everly & Allison, an engineering firm of Albuquerque, New Mexico. The fulfillment of this contract will initiate a $500,000 highway project for Grand Canyon National Park to be known as Grand Canyon East Approach.

Construction of the new highway, which will also afford an improved connection with nearby Mesa Verde, Zion, and Bryce Canyon National Parks and also the more northern ones, including Yellowstone, is in line with the President's policy of proceeding with federal construction programs to relieve unemployment. If weather permits, work will begin about January 1.

While the road construction to be undertaken immediately covers only two sections, one between Desert View and the boundary line of Grand Canyon National Park and the other in the Waterloo Hills section, each more than three miles in length, the entire project contemplates a highway more than 30 miles long which will connect the park with United States Highway 89 at Cameron, Arizona, a distance of 55 miles from Flagstaff. Only federal lands, controlled either by the Indian, Forest or Park Services will be crossed throughout the entire route, which offers ready access to the Navajo Indian and Painted Desert country.

Engineers of the Bureau of Public Roads, who are cooperating with the National Park Service on this project, believe that about three years will be required to complete the project which presents a variety of construction and offers all the difficulties to be expected in such an inaccessible region. A 300-foot viaduct, two major bridges at least 50 feet long, ten smaller bridges and many drainage structures are included in the plans.

With a view to making the Grand Canyon East Approach an outstandig example of modern road building from both construction and landscape viewpoints, Secretary Wilbur stated that exhaustive preliminary studies have been con-

ducted by landscape architects and engineers of the National Park Service. He believes that when the highway is completed it will offer a scenic route unexcelled in the Southwest, and will add another to the list of superlative scenic drives in the national parks.

New road construction projects for the Grand Canyon National Park recall the difficulties and dangers involved in the construction a few years ago of the famous Kaibab Trail and steel suspension bridge to connect the North and South Rims of the canyon. All materials and supplies, even drinking water, had to be packed into the canyon on the backs of mules. To one construction camp alone on the South Rim 11 tons of TNT were carried down trails so rough that traveling empty-handed would have been a hazardous undertaking. Down such trails sure-footed mules carried all the materials used in the steel suspension bridge across the Colorado River which weighs 100 tons.

Cement Mills Continue to Show Production Decline

ACCORDING to statistics by the Bureau of Mines of the Department of Commerce, the ratio of operations to capacity of American Portland Cement Mills for the last twelve months was 44.4 per cent. The ratio for the twelve months ending November 30, 1930 was 62.6 per cent and for the twelve months ending November 30, 1929 was 66.8 per cent.

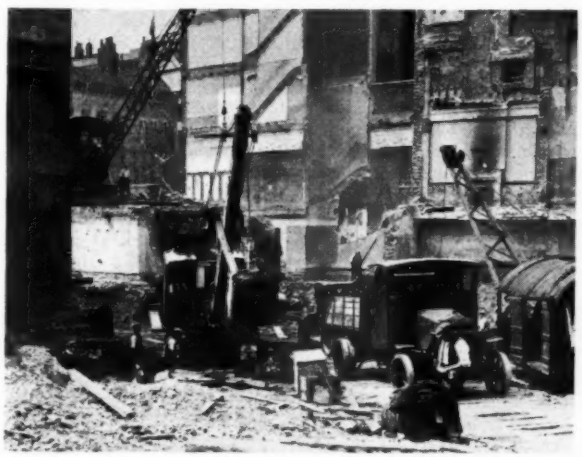
During the month of November 1931, 8,161,000 barrels were produced, 7,156,000 barrels were shipped, and stocks on hand at the end of month were 22,223,000. November production was 26.5 per cent less and shipments 18.5 per cent less than in November 1930. Stocks at the mills were 3.6 per cent less than a year ago.

Foreign

Columbia

The National Government of Columbia has cancelled all existing contracts for highway construction. A **new plan for constructing national highways** is being formulated and will probably be published before the end of 1931.

England



The above picture was made while **Willment Bros., Ltd.** were clearing the side for a new store building in Oxford Street, London. The scene bears a marked similarity to similar excavating operations in most any of our American cities. The Ruston-Bucyrus ¾-yard 1030 with 23 foot boom and 15 foot sticks is as trim a rig as any American shovel. The Hallford truck (which the driver has christened "Betty") unloads by dropping the side boards and shoveling off, but otherwise it looks much like American models of similar vintage we see on our own jobs. The Ruston-Bucyrus No. 4 crane at the right has a roof line that seems a bit odd to the American contractor but under the roof is a fast and efficient machine that has proven a credit to its builders. Just behind the corner of the building at the left is a compressor and in the center background you'll see a workman with an air hammer breaking down the old brick walls. This broken masonry is loaded by hand to buckets, hoisted and loaded by the track crane shown in the upper left.

France

L'Entreprise Razel Freres of Paris used their Ruston-Bucyrus No. 10, Caterpillar Tractors and Euclid Wagons in grading this airport at Limoges.

Russia

In its **"Bulletin of Economic Information,"** the U. S. S. R. Chamber of Commerce states that 435,000,000 roubles (which, at par, is about $220,000,000) has been invested in the Soviet non-ferrous metal industry in 1931. During 1932 an investment of 700,000,000 roubles is expected. The following new plants have been planned or put into operation recently by the Soviet government: The Uralmedstroi copper plant, with a capacity of 20,000 tons of copper annually; a new concentrating plant in East Siberia, as well as a number of ore washing plants and power units for alluvial production of gold and platinum; in West Siberia, the Constantinowsky and Belowsky zinc units have been started; an electrolytic unit and a concentrator, with a capacity of 100,000 tons of copper annually, are being built at Swerdlowsk, to start work in 1932. Other activities include a zinc unit at Tcheliabinsk, now under construction; in Ufala, a nickel plant with an annual capacity of 5,000 tons to start next year; at Baskiria in the Ural district, where copper deposits are being explored, plants under construction will have a capacity of 40,000 tons annually. Remodeling of the work at Kalata and Karabash will give each of these units a production capacity of 35,000 tons annually. The largest unit in this area will be the Degtiar plant, with an eventual capacity of 150,000 tons annually.

Canada

Quebec

An appropriation has been voted by the City Council, Sherbrooke, Quebec, of **$130,000 for concrete and asphalt road construction** work, to begin shortly. For information address A. Deslauriers, City Clerk, Sherbrooke, Quebec.

Ontario

The Dominion Government has approved **unemployment relief plans** of 131 Ontario municipalities for a total expenditure of $20,778,318, of which $4,000,000 is for expenditure on provincial highways and $3,500,000 on the Trans-Canada Highway.

He: "I can tell by looking in a girl's eyes just what she thinks of me."

She: "How annoying."

"Paw?"

"Now what?"

"Why didn't Noah swat both the flies when he had such a good chance?"

New England Notes

By J. C. ALEXANDER

Carlo Bianchi & Co. have made splendid progress on the Nashua, New Hampshire State road contract. Towards the end of the job **Ernest Spencer** operator on one of Mr. Bianchi's Gas+Air shovels was moving at the rate of 48 five-yard truck loads per hour. Mr. Spencer had hoped to set up a record for the amount of dirt moved by a 1¼-yard shovel, but on account of the shortage of trucks was unable to find out just how much it was possible for a good operator, and a good machine to move in good digging.

Philadelphia and Vicinity

By M. G. CONWAY

The enlargement of Capitol's grounds, terrace, foundations and reflection pool has a 500 car garage underground for our National Senators and Representatives. During the war and up to a year ago the Capitol grounds between the Capitol and Union Station Plaza were covered with temporary three story buildings to house the war workers in Washington. This past year all these buildings have been demolished and there is nothing now to obstruct the view between Union Station and the Capitol. The entire landscape work is expected to be finished for the Washington Bi - Centennial Celebration. Part of this work is shown in the accompanying picture. The Bucyrus-Erie GA-2 in the forefront of this picture is owned by **Thompson & Davis of Alexandria**, Virginia, and **L. W. Thompson** is at the levers. They are working for **H. R. Blogg & Co.** of Dayton, Ohio. The Gas+Air is doing the grading for the garage floor and also dropping the grade so that street cars will be underground in this area.

This Bucyrus-Erie Type-B steam crane working on the banks of the Potomac on the Virginia side with the Washington Monument in the background, is owned by **Merritt, Chapman & Scott.** They have just finished reinforcing the Potomac Railroad bridge and also taking care of the underpass of the new Mount Vernon Blvd., which runs from Washington directly to Mount Vernon, the home of our "First President".

Buffalo and Vicinity

By D. E. WHITE

The New York State General Contractors Association will hold its 1932 meeting in Utica.

Bart J. Ruddy, Utica contractor and member of the directorate of the state organization has notified Charles G. Bennett, chairman of the conventions committee of the Utica Chamber of Commerce that the directors had selected Utica as the place for the annual meeting which will probably be held in March.

The convention lasts two days and is usually attended by about 500 persons, including all leading contractors of the state.

Charles Shaffer & Sons, Buffalo, N. Y., have completed their work at Rochester, and have moved in on their new State Highway contract out of Ossining, N. Y., and during the past month have made wonderful progress on the new project. They have moved in their three Bucyrus-Erie B-2 machines and also their 32-B gas shovel. If weather conditions continue they, no doubt, will work straight through this Winter.

Leo Malone, Lake Placid, N. Y., has completed his work in Hamilton County, but has considerable work at present in Lake Placid, N. Y., in preparation for the 1932 Olympics.

Paul R. Beals Construction Company, Inc., Buffalo, N. Y., was recently low bidder on a large job outside of Syracuse, N. Y. There is plenty of excavation which will mean that Paul will have a Winter's job.

Kingsbury Construction Company, Glen Falls, N. Y., are at present operating their GA-2 out of Port Henry, N. Y. Our old friend, **Neil Havens,** is at the levers.

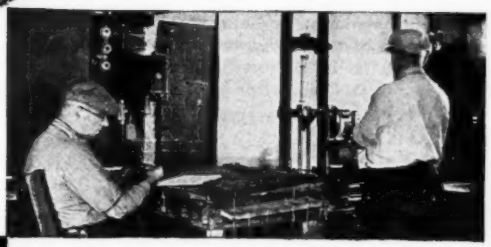
Clemente Brothers, Troy, N. Y., who operate a sand pit have had a very good year considering the so-called depression and have managed to keep their GA-2 and several portable loaders working continuously all summer.

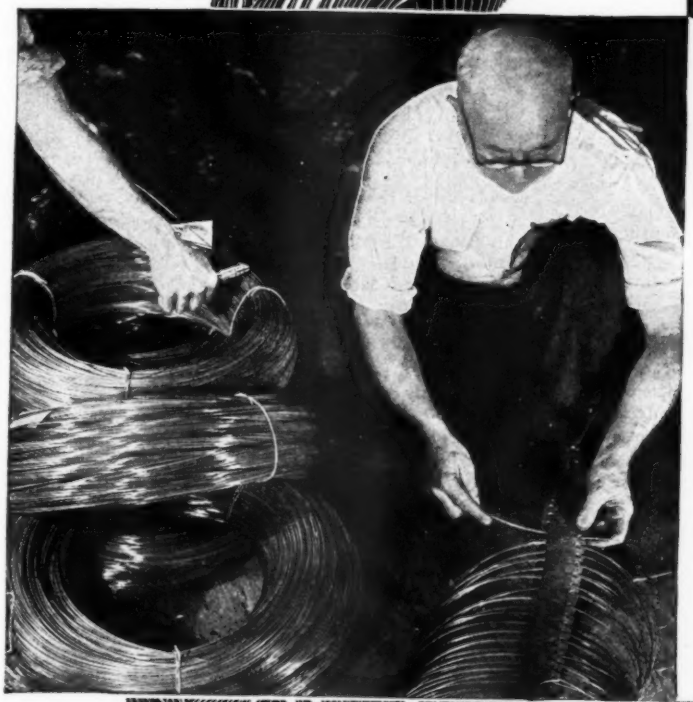
Pittsburgh and Vicinity

By J. S. WEAVER

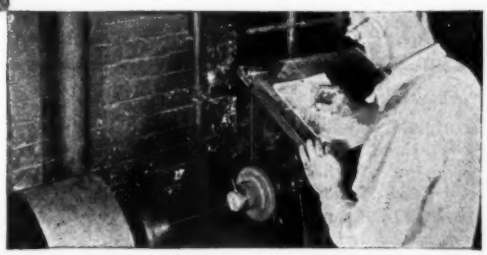
Work on sewer **projects totalling $430,000,** giving employment to several hundred men is to be started in Allegheny County within the next few weeks. Four municipalities will share in the work. They are, Munhall, $200,000; East McKeesport, $30,000; Whitaker, $10,000; Ross Town-

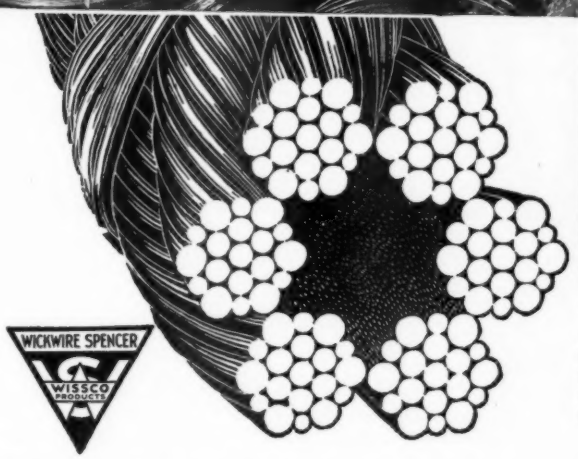
Testing *your wire rope*





YOUR wire rope?...Yes, for *every* bundle of wire that will later become a part of Wickwire Spencer Wire Rope is sampled twice. Each sample is tested independently for tensile strength, elongation and torsion. These tests are in addition to our chemical, physical and micro-photographic tests that all Wickwire Spencer Wire undergoes in course of manufacture. The meticulous care with which this rope is made is reflected in the excellence of the product.





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Shots From the Firing Line — *Continued*

ship, $200,000. Permits for the sewer construction have been granted by the Pennsylvania State Sanitary Board.

Allegheny County Commissioners have authorized a $3,000,000 high level **bridge across the Monongahela River** at Homestead to replace Brown's Bridge. Approval of Congress will be sought by County Solicitor Lesher at once for construction of the bridge over a navigable stream.

Frank Kukurin, Wilmerding, Pa. has been awarded the contract for the construction of a new bridge in McNeilly Avenue over Saw Mill Run, Baldwin Township. This is a county job.

Richard (Dick) Smith, is operating a shovel for Booth & Flinn Company on the foundation of the new Federal Building in Pittsburgh.

The contract for the construction of the Albany-Reneselaer Bridge and the elimination of the grade crossing was awarded to the **Booth & Flinn Company,** Pittsburgh. The project is under the New York State Division of Highways.

The Annual convention of the **National Crushed Stone Association** will convene at the William Penn Hotel, Pittsburgh, January 19th to January 22nd, 1931.

JOSEPH G. ARMSTRONG

Thousands of citizens, from the humblest to the greatest, paid their last respects to County Commissioner Joseph G. Armstrong on Monday November 23rd, as his body lay in state in the rotuna of the Allegheny Court House. Many laborers were seen in the long line that paid farewell tribute to the man who rose from a glassblower to the highest political offices of the City and County. Immediately before the services, Judges, Senators, Congressmen, Members of Council, Mayor Kline and his cabinet and City and County officials passed silently by the casket. The corridors were banked with flowers. Mr. Armstrong was a man who did things, and as one looks over Pittsburgh and Allegheny County, viewing the things he built, not only for now but for the future, we can all, as citizens say "Well done thou faithful servant, your work is your monument."

Major W. D. Styer, chief of U. S. Army Engineers of the Pittsburgh district, has issued a call for bids for the construction of **Dam No. 4, Monongahela River.** The closing date is 12:00 noon, December 21. The estimated cost of the project is approximately $200,000. The site of the dam is about 1¼ miles above Charleroi, at Rostraver. The lock contract was awarded to the Dravo Contracting Company and this phase of the work is nearing completion.

Simultaneous passage by house and senate of the bill making the unexpended balance of $1,150,000 available for clearing and road construction at the **Pymatuning Dam project** and of a new appropriation of $515,000 for the **Torrance State Hospital** today featured a brief legislative session in which Gov. Gifford Pinchot's relief program was again under fire.

Atlanta and Vicinity

By R. S. WELFER

C. G. Fuller, Barnwell, S. C. was awarded 22 miles of bituminous surface treatment at the December 1 letting. Mr. Fuller has a number of jobs under way in the State, and travels frequently by plane.

A. H. Singer, La Fayette, Ala., reports good progress on his Georgia and South Carolina work.

Brick manufacturers in the Southeast have received scattered but welcome orders for Government buildings.

South Carolina advertised for bids on highway bonds in late December, and it is hoped they will continue their roadbuilding program in the new year.

L. D. Smith, York, S. C., is using a new Bucyrus-Erie Type 37-B gasoline shovel on Sutton Brothers highway project between York and the N. C. line.

C. G. Kershaw Contr. Co., Birmingham, have made good headway on their highway work near Butler, Ga.

Kentucky Notes

Jefferson County, Kentucky, is using the above Bucyrus-Erie E-2 1¼ yard Diesel dragline for excavating in a new park improvement and sewer job near Louisville, Kentucky. Jefferson County has taken advantage of the low excavation costs available with equipment using low cost fuel oil such as this dragline with its Atlas Imperial Diesel engine.

Detroit and Vicinity

BY L. E. MacDONALD

Blanck & Gargaro of Detroit were awarded a contract on Flint's $690,000.00 sewer program; the **R. D. Baker Company** of Royal Oak was awarded six contracts on this same program.

The contract to build the new pavement on M-14 from Sheridan south nine miles to connect with the pavement at **Wood's Corners** has been let to **W. L. Thon Company** of Wyandotte for $251,378. **The Bruce Excavating Company** have the sub-contract for the excavation and have four Bucyrus-Erie machines at work.

The Louis Garavaglia Company of Detroit was low bidder on a 7.174 mile stretch of grading and drainage structures on M-66 at $89,502.22.

GARDNER S. WILLIAMS

Major Gardner S. Williams, 65, hydraulic and sanitary engineer of national prominence, died December 12th after a long illness. He was a professor of engineering at the University of Michigan and recognized as an authority on hydraulics.

Thirty years ago at Ithaca, New York, he built the first dome dam, a type later adopted for the Coolidge dam across the Gila near San Carlos, Arizona.

From 1926 to 1930 Major Williams was engaged by Detroit in its thirty million dollar water department expansions. During his later years he devoted much time to Mississippi River problems and advocated deepening and straightening the channel to control floods and aid navigation.

Chris Reger of East Lake was low bidder on a 16 foot wide stretch 1.512 miles long, two course gravel relocation on M-63, with a bid of $18,509.96.

Ford Road under construction for nearly eight months, was opened to traffic November 27. Through traffic both on Ford Road and Oakman Boulevard has been afforded by construction of Pere Marquette and Oakman D.S.R. grade separations. The cost of this important project was approximately $600,000.

Look at the tremendous ATHEY saving in maintenance

■ These savings are not estimates or salesmen's hopes. They are based on accurate cost records for almost every type of job, under a multitude of conditions and over a period of years. They definitely show ATHEY'S tremendous savings of 75% in track maintenance — the economies of being able to rebuild it three or four times to original efficiency at very little cost—the simplified construction and easy, inexpensive replacement of wearing parts. ■ ATHEYS, with their longer life, lower maintenance costs, higher efficiency, lighter running qualities, exceptional strength, important operating advantages and a twelve-year service record, bring you extra profits that no other equipment can duplicate. It will pay you to write for complete information.

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Shots From the Firing Line — *Continued*

By D. S. WATTERS

As this is written **Joe Poupore, of John V. Barr & Company,** Windsor, Ontario is moving his Bucyrus-Erie Class 14 dragline over from Canada to commence work on a dredge and fill project at St. Claire shores.

December 1st marked the **closing of the Lakes shipping** season although the mild weather this year may permit shipment of a few more cargoes of limestone and ore. The majority of rock quarries in Michigan have either shut down for the winter or else will devote their time to overburden removal. Some quarries in northwestern Ohio are likewise closed for the winter.

Illinois Notes

By H. C. HELT

The Illinois State Highway Department recently purchased of **Western Wheeled Scraper Company,** Aurora, Illinois, 247 Ford and Chevrolet Snow Plows for use in maintaining the state highways throughout the winter. This Western Snow Plow is a high speed, easily detached, 7-foot blade for use on Ford AA or Chevrolet six-cylinder trucks. It meets the needs of Highway Departments that own small trucks or desire a small fast-moving and inexpensively operated snow plow for congested districts.

An appeal from the excavating contractors of Chicago was made recently to the general public to **build now.** The excavating contractors agreed to excavate at cost in order to keep their organization together. This offer together with the low prices of materials and supplies should be some encouragement to those contemplating construction at this time.

Considerable interest is being shown by local contractors in this district in the **Government jobs at Alma, Wisconsin and Rock Island, Illinois** that come up for letting December 18th this year. Both of these jobs have considerable excavation on them and a lot of it is rock.

The Calumet Paving Company of Gary, Indiana was low bidder recently on a large paving job on State Highway No. 25 Lafayette to Delphia, Indiana. Awards are expected to be made soon.

The State Highway Department of Illinois is making a **whirlwind finish** on their highway lettings in order to get all or as much of their 1931 paving program out of the way as possible. Four lettings all of a considerable size have been held at Springfield, Illinois in the last 60 days. This covers about **25 million dollars** worth of pavements and bridges. Some of these will be started this winter.

The paving contractors around Chicago and in Cook County are winding up their Cook County work as fast as possible. Most of them have put their equipment away for the winter. **Next year promises to be a busy one** as there are a great many jobs of paving scheduled for the Chicago area.

Bids will be opened on January 5th by the U. S. Engineers Office, Room 344 Federal Building, Rock Island, Illinois covering the construction of a cut-off levee in the Indian Grave Drainage District of Illinois. This new cut-off levee will be 3,955 feet in length, involves an estimated yardage of 165,000 yards and will be 16.3 feet in height. The work is about four miles north of Quincy, Illinois. Material will be secured from a river side borrow. Completion of the work is required in 125 calendar days with time out for high water or frozen material.

By E. T. OBENCHAIN

Jensen and Schaefer of Pekin, Illinois are making good progress on their grading job between Henry and Magnolia. They are using a Northwest and a Bucyrus-Erie "B" shovel loading into Cat wagons. Buck Weaver is job superintendent.

H. H. Enbody and Son Company of Aurora have finished up their work at Geneseo for the Carson Construction Company.

Hillquest Construction Company of Geneva, Illinois has started building the fill for the approach to the Cedar

For your convenience in writing to American Steel & Wire Company you will find a card bound in this issue.

Costs less to move

THE unequalled mobility of the Bucyrus-Monighan Walker makes it easy to negotiate the devious, sloping route often encountered in loading onto or unloading from a barge.

Its ability to sidestep, move at any angle or take a short step when necessary, makes it possible to spot the machine just where it balances and rides perfectly. Bucyrus-Monighan Company, Chicago, Illinois.

BUCYRUS MONIGHAN

Walking Draglines up to 8 cubic yards

Sold by **BUCYRUS-ERIE COMPANY, South Milwaukee, Wis.**

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B-14

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OFFER MAXIMUM ECONOMY
IN LUBRICATION & MAINTENANCE
OF OUTDOOR EQUIPMENT . . . . .

THE enduring character of Gredag lubrication and the superior protection it affords against rust and corrosion in outdoor service are reasons for the established fact that Gredag reduces lubrication and maintenance costs.

The economy effected by Gredag lubrication has been demonstrated by many tests and by records of lubrication and maintenance costs over long periods of service.

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INSURES LUBRICATION

NATIONAL CARBON COMPANY, INC.
Carbon Sales Division
CLEVELAND, OHIO
Unit of Union Carbide UCC and Carbon Corporation

Branch Sales Offices
NEW YORK PITTSBURGH CHICAGO SAN FRANCISCO

Shots From the Firing Line — *Continued*

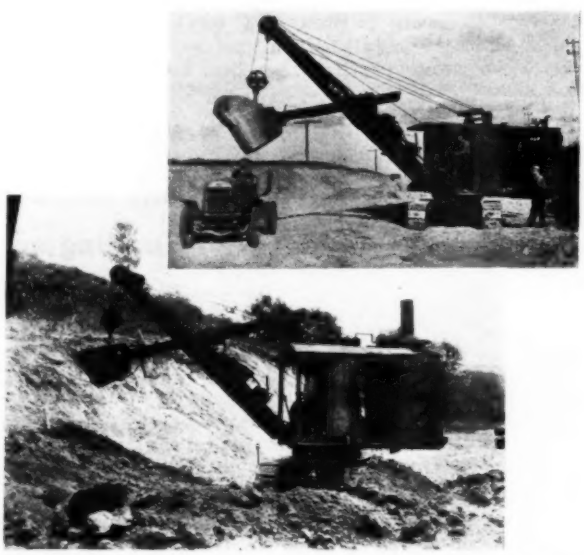
Street Bridge at Peoria. The dirt is being moved with a Northwest and a Byers shovel loading into trucks. "Bear" Hillquist is in charge.

Krueger Construction Company of Park Ridge is grading on Route 47 south of Huntley, Illinois with a Bucyrus-Erie D-2 shovel and elevating graders. F. M. Krueger and his son Fred are on the job. Jordon Clark is superintendent and Buell Black is running the D-2.

The Melahn Construction Company of Algonquin has finished a paving job between Richmond and Antioch. Mr. Melahn put 13 miles in in short time.

By A. W. ANDERSON

No time was lost by **Gund-Graham Company** of Freeport in digging the basement for the new post office at Freeport. The job totaled about 4500 yards including some old foundations which the B-2 steamer handles nicely. Operator **Guy Shillito** found the Anderson dipper trip, which has been installed on this B-2 a decided help. Ole Olson did the firing.

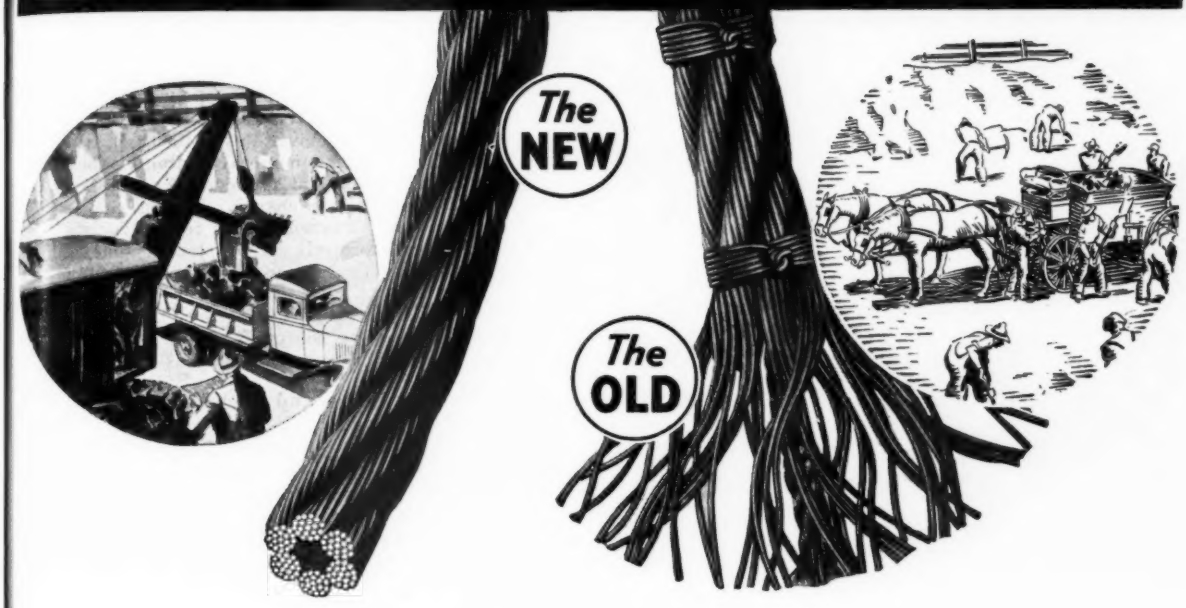


Here we see the Gas+Air owned by **Gund-Graham Company**, Freeport and the Type B steamer owned by John Talbot & Sons, Monmoth working on the Mount Morris-Oregon highway job. The excavating on this job was sublet to John Talbot and Sons who had their Type B steamer loading rock to Indiana trucks. To speed up the work the Gas+Air was brought in. In all there were about 45,000 yards of loose rock of hard digging and 40,000 yards handled by an elevating grader drawn by Allis-Chalmers tractors.

For your convenience in writing to National Carbon Company, Inc. you will find a card bound in this issue.

As the Steam Shovel excels the Pick and Shovel

Preformed Wire Rope excels old-fashioned ordinary wire rope



PREFORMING . . a basic principle recognized the World over

IN ENGLAND, Germany, France and Canada as well as here in the United States, leading users of wire rope demand it be made on the preformed principle. This demand is based on service records that prove 30% to 300% increased service over ordinary wire rope — depending on the type of equipment and nature of service.

● TRU-LAY is the fore-runner of all Preformed Wire Rope. Tru-Lay gradually but surely won first rank in the sales of the American Cable Company—until now most of our customers specify Tru-Lay Preformed Wire Rope as a matter of course.

● The chief reason for 30% to 300% longer service with Tru-Lay is the elimination of internal stress. Wires and strands are set to a helical shape so they lie naturally in position . . . whereas in ordinary wire rope there is a constant effort on the part of the wires and strands to straighten out, resulting in early fatigue and premature breakage of wires. Thus Tru-Lay excels ordinary wire rope as the modern power shovel excels the pick and shovel.

● Look at your annual wire rope bill. Then think what 30% to 300% increased service would mean to your overhead in these days when every dollar counts.

Send for this complete story

● Write for your copy of "Why Preformed Wire Rope" on your business letterhead. This story in pictures is non-technical, can be read and understood in a few minutes. Everyone in any way connected with the use or purchase of wire rope should read it.

● If you prefer to have a representative call, a letter or wire will receive immediate attention. Address:

AMERICAN CABLE COMPANY, *Inc.*

New York Central Building, 230 Park Ave., NEW YORK CITY

District Offices: Chicago, Denver, Detroit, Philadelphia, Pittsburgh, Tulsa, San Francisco

The following manufacturers have been licensed to manufacture Preformed Wire Rope under the American Cable Company's Patents Nos. 1,513,583–1,518,253–1,643,150. (Other patents pending.)

(*In the United States*)
American Steel & Wire Co.
Broderick & Bascomb Rope Co.
E. H. Edwards Company
Hazard Wire Rope Co.
Pacific Wire Rope Co.

(*In Canada*)
Dominion Wire Rope Co., Ltd.
Anglo-Canadian Wire Rope Co., Ltd
Canada Wire & Cable Co., Ltd.
B. Greening Wire Co., Ltd.

ACCO

An Associate Company of the American Chain Company, Inc.

TRU-LAY PREFORMED WIRE ROPE

30% to 300% Increased Service [Depending upon the character of the service and type of equipment

For your convenience in writing to American Cable Company, Inc. you will find a card bound in this issue.

Shots From the Firing Line — *Continued*

The Gas+Air shown is the first to make its appearance in Freeport and vicinity and has been doing good work since 1926. Gund-Graham Company have two jobs which are tied up on account of the wage law dispute, but will probably go to work on them soon because they were low bidders the second time the bids were opened but at this writing the contracts have not yet been awarded. These jobs are a 14 mile job in Mercer County and a 6 mile job in Kane County.

Wisconsin Notes

Up on his Stevens Point job, contractor **A. E. Bounsall** of Kenosha had a bit of clearing to do now and then. There wasn't much to it though, the way Mr. Bounsall worked it with his Bucyrus-Erie 1035 shovel. Operator Phil Adler would just run the 1035 up in front of the tree that needed to come out, put the dipper against the trunk about level with the boom engine, throw in the crowd and push. And that would be that, for over would go Mr. Tree, pulling its stump and roots right along with it.

Minnesota Notes

S. J. Groves & Sons Company of Minneapolis, formerly located at 458 Sexton Building, announce the removal of their general offices to 509-510 Wesley Temple Building.

Iowa Notes

By E. T. OBENCHAIN

The Union Construction Company of Des Moines have finished the Crane Creek Levee near Beardstown, Illinois and have moved across the river to the South Beardstown levee job. This is a combination pump and dragline job. They are using a 12 inch pump and a Bucyrus-Erie 52-B Diesel dragline. D. E. Thomas is in charge.

The State of Iowa has taken bids on cement for its 1932 highway construction projects. Approximately **one million barrels** are involved. Twelve cement companies submitted prices.

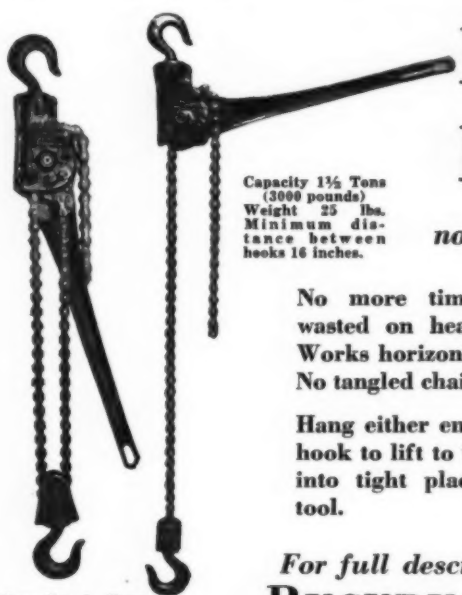
The McCarthy Improvement Company of Davenport were low bidders on a grading job on Route 73 in Stephenson County at a letting held November 30th at Springfield.

St. Louis and Vicinity

By A. J. KOENIG

The Terminal Railroad Association of St. Louis has about **$1,110,000 in work under contract** for the east approach of the Municipal Bridge railroad deck. This is the first unit of the Terminal's plan for rerouting and co-ordinating the railroads entering St. Louis from the East. The approach is 6,000 feet long, dropping from a 70 foot elevation where it leaves the railroad deck of the Municipal Bridge to street level at Missouri Ave. in E. St. Louis, at the present Relay Depot. The steel structure is being built by the Ben Hur Co. and the foundations are being laid by Moore Bros. Construction Co. The fill is being made by **Fruin-Colnon**

Often pay for themselves in the first week of service



Capacity 1½ Tons (3000 pounds) Weight 25 lbs. Minimum distance between hooks 16 inches.

HANDY HOISTS

now offered in four sizes

No more time and backache wasted on heavy chain blocks. Works horizontally or vertically. No tangled chain.

Hang either end up, just a light hook to lift to the support. Gets into tight places. A one man tool.

Capacity ¾ Ton (1500 pounds) Weight 14 lbs. Minimum distance between hooks 13 inches.

Capacity 3 Tons (6000 pounds) Weight 31 lbs. Minimum distance between hooks 17 inches.

Capacity 6 Tons (12000 pounds) Weight 65 lbs. Minimum distance between hooks 25 inches.

For full description and prices write to

BUCYRUS-ERIE COMPANY

SPECIALTY DEPARTMENT

South Milwaukee, Wisconsin, U.S.A.

BUCYRUS ERIE

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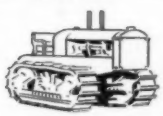
COMPANION TRACTORS

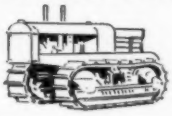
Allis-Chalmers Models "35" and "L"

The powerful, flexible Model "L" forging ahead through sand, loam or clay, casting *more dirt*, for the sturdy, fast "35"s to make *more trips*. In these A-C tractors are embodied the sound engineering principles that have made Allis-Chalmers justly famous. They are "GO-GETTERS", these companions. *Allis-Chalmers dealers are ready to show you.*

SPEED — POWER — ECONOMY — PERFORMANCE



ALLIS-CHALMERS



MILWAUKEE, U. S. A.

"Allis-Chalmers Power for Every Purpose"

For your convenience in writing to Allis-Chalmers Mfg. Co. you will find a card bound in this issue.

Shots From the Firing Line — *Continued*

Contracting Co. of St. Louis, which company is pumping sand for the fill at the rate of 3,500 cubic yards per day. 300,000 cu. yds. of sand will be required. When the approach is completed the overhead crossing at Broadway and the new Union Station will be built.

The State Highway Department of Illinois **continues with their large program** of highway construction. Bids were received on Nov. 30th for 102 miles of paving, 19 miles of grading and 16 bridge sections at a total cost of $2,644,000. Some of the successful bidders are as follows: Hartman-Clark Bros. 9.73 miles paving Dewitt county, $121,834; 4.18 miles paving Montgomery county, $64,134. Amos Culbertson, Oconee, Ill., 2 bridges in Montgomery county. Robt. H. King, Danville, Ind., Bridge in Montgomery county. Cameron-Joyce & Co., 4 miles paving in Montgomery county.

The following contracts were also let: Davis Construction Co., Boonville, Mo., 15.83 miles of paving in Christian county, $240,852. 3.71 miles paving, Sangamon county, J. C. O'Connor & Sons, Ft. Wayne, Ind. 3.63 miles grading Pike county, C. S. RR Construction Co., Jacksonville, $38,955. 1.07 miles grading Logan county, Martin Wunderlich, Jefferson City, Mo., $18,556. 4.57 miles grading St. Clair county, Burch Construction Co., Madison, Wis. Three bridges in Madison county to Mo. Bridge & Iron Co., St. Louis, Mo. 7.83 miles paving in Madison county, Jos. Kesl & Sons, Edwardsville. 3.44 miles paving Alexander county, Jos. Kesl & Sons. Bridge in Lake county, S. J. Groves & Son, Libertyville. 7.37 miles paving Christian county, $107,437. 8.18 miles paving in Platt county, $119,214, Hartman-Clark Construction Co.

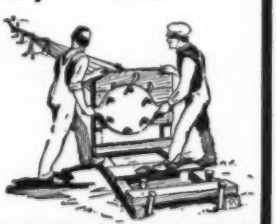
Riley Construction Co. was low bidder for the construction of the Rock Creek Sewer in the Kings highway District, south of Arsenal St. The sewer will be a 16 foot closed drain, 890 ft. long and an open channel for the remaining 2800 feet. Their price was $76,449. Ten bidders participated.

Martin & Reilly, prominent St. Louis Sewer Contractors are progressing very nicely on their Wherry Avenue Sewer Project in St. Louis. The job consists of constructing an 18 foot concrete tube approximately a mile in length which is a part of the new Sewage system of St. Louis Hills, a new subdivision in Southwest St. Louis.

The outlet of the Sewer is on the River Des Peres. The duration of the job is about one year. The above illustration shows Martin and Reilly's 37-B Dragline excavating for the tube. Charlie Otis is handling the levers. Jim Reilly and both Frank Martins (Senior and Junior) are personally supervising the work.

At the letting of the Missouri Highway Commission on Dec. 3rd at Jefferson City 922 bids were received on one hundred projects consisting of 22.8 miles of concrete paving, 249 miles of gravel road and 48.2 miles of grading.

Since Blast Holes were Drilled by Hand



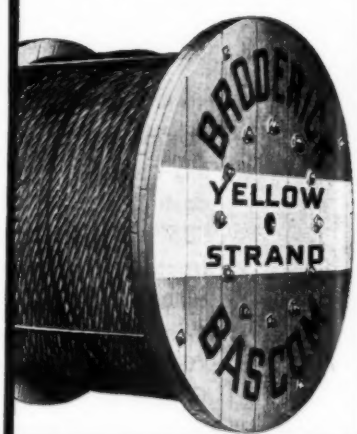
THE first B & B Wire Ropes were made on an old fashioned "rope walk" in 1876, when many blast holes were drilled by hand, when dredges had no cutters, scrapers used horse power, and such powerful rope as Yellow Strand was not essential.

Since its introduction, Yellow Strand's elasticity and strength have been equal to every advance made in excavating machinery. Great economies are effected with Flex-Set Preformed Yellow Strand Rope. Prove it by a trial.

Get Catalog 51

Broderick & Bascom Rope Co.
St. Louis
New York Houston Portland San Francisco Seattle
FACTORIES: St. Louis and Seattle

Wire for all B&B Ropes undergoes many important laboratory tests before being laid up into rope.



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YELLOW STRAND WIRE ROPE

MADE OF WIRE DRAWN TO OUR SPECIFICATIONS FROM GENUINE SWEDISH STOCK

For your convenience in writing to Broderick & Bascom Rope Co. you will find a card bound in this issue.

for Long Enduring Service

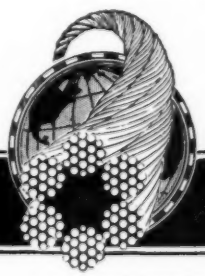
Williamsport Wire Rope

Good engineers know there's a vast difference in various makes of wire rope and the service it renders.

The point we wish to leave with you is that our interest in the manufacture of wire rope is not divided. . . .

We make wire rope only — nothing else and that we concentrate our facilities and train our men to perfection in this task.

May we send you our latest catalog and data book which tells you a lot more about Williamsport Quality?



WILLIAMSPORT WIRE ROPE CO.

Main Office and Works
WILLIAMSPORT, PENNSYLVANIA

General Sales Offices
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WHEN IS YOUR BUCKET OBSOLETE ?

AN unprofitable bucket is obsolete. A bucket that does more work in less time at a lower cost is the bucket you should be using—That's an Owen. Money-making producer from the very start. Speeds up results—Cuts labor costs—Increases yardage per hour. Handles more work per week. And all this under a positive guarantee. Ask any Owen owner. Write for specific data on Owen performance.

The Owen Bucket Company
6026 Breakwater Ave., Cleveland, Ohio

A MOUTHFUL AT EVERY BITE

Owen Buckets

Shots From the Firing Line — *Continued*

Some of the successful contractors are as follows: Martin Wunderlich, Jefferson City, fifteen projects; F. T. O'Dell, Hannibal, ten projects; Otto Knutson, Kansas City, nine projects; Lahar Construction Co., five projects. The 17 miles of concrete paving in Jackson county went to Lytle Construction Co. at a price of $443,000.

Bids were rejected on nineteen projects and will be relet December 18.

It is reported that the **Ajax Pipe Line Co.** will soon start work on the third 10 in. line from the fields in Tulsa county, Okla. to the Standard Oil Plant at Wood River, Ill.

The Kansas highway commission plan to have under contract by early Spring **$2,000,000 of highway construction** consisting principally of grading, culverts and bridges.

H. H. Hall Construction Co. was awarded a nice paving job in E. St. Louis, Ill.

The Davis Construction Co., Boonville was awarded contract for two sections of concrete paving in Jackson county.

During the month of November the United States Engineers at Kansas City let contracts for approximately **$3,120,000 of pile and revetment work** on the Missouri River between Leavenworth, Kans. and Herman, Mo. Fifteen projects were awarded.

Wyoming Notes

Caterpillar Tractors and Streich wagons take it away from the above Lorain 75 on **L. A. Woodward Company's** job on Federal Highway 16 east of Sheridan.

Colorado Notes

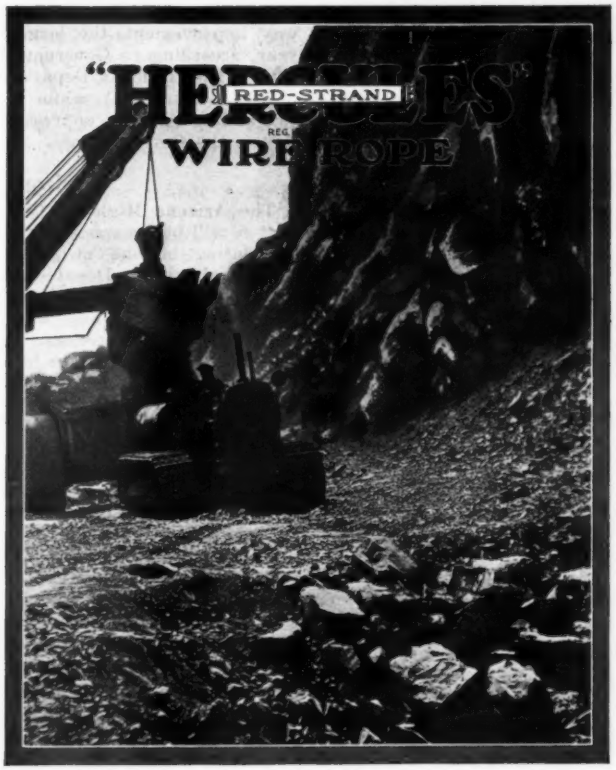
By H. N. STEINBARGER

Operator John Ross, Jr., is handling the Bucyrus-Erie 1020 dragline owned by the Gering Irrigation District. Mr. Ross is most enthusiastic about the digging ability and ease of handling in the 1020. He tells us he had a couple of the Gering and Ft. Laramie Irrigation District operators as callers recently and let them try the machine out. As Mr. Ross put it: "They were **shocked** when they got hold of the controls and found how easy they worked."

By H. M. BIBAUD

Heavy storms, unusual for November and early December have been sweeping southern Colorado for several weeks, **interfering seriously with traffic and closing mountain passes.** There is not much possibility of opening many of them before spring in spite of the efforts of crews with powerful snow plows who have been operating diligently. The latest storm of December 9th gave Cumbres Pass 12-feet of snow, while Wolf Creek Pass lies buried under drifts somewhat deeper. Crews have been at work continuously lately, on the D. S. O. Highway. Major J. P. Donovan, maintenance supervisor for the State Highway Department states that the Million Dollar Highway will be kept open as long as possible this winter.

For your convenience in writing to The Owen Bucket Company you will find a card bound in this issue.



Excavating for a Highway to the Hoover Dam
A difficult job that had to be done quickly was the highway to the Hoover Dam site. It was built by R. G. Le Tourneau, Inc. with the aid of "HERCULES" (Red-Strand) Wire Rope.

Dependable—Economical

"HERCULES" (Red-Strand) Wire Rope is uniformly dependable and economical because all of the materials that go into it—wire, core and lubricant—are of the very highest quality; moreover, our standards are set high, and our manufacturing methods are such as to insure even tension on both the wires and the strands, which means that every wire and every strand does its full and equal part.

1857 - 1932
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ANNIVERSARY
A. LESCHEN & SONS
★ ROPE CO. ★

Because "HERCULES" (Red-Strand) Wire Rope is so long-lasting and trustworthy, it is an excellent rope for hard work of all kinds. It is in high favor especially with all operators who are working on a small margin of profit, as it helps to stabilize and also to reduce the actual operating costs. Made in both the Round Strand and Patent Flattened Strand constructions in order to meet all working conditions.

Please feel free to write us for catalogs and further details

Made Only by **A. LESCHEN & SONS ROPE CO.** Established 1857

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New York - - - - **90 West Street** **Denver** - - - - **1554 Wazee Street**
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For your convenience in writing to A. Leschen & Sons Rope Co. you will find a card bound in this issue.

You can't afford to carry dead weight on the payroll today. It costs money to keep Old Danger on the job . . . . and he isn't much of a help. Let an expert from the Taylor engineering department show you how to shackle this menace . . . . and cut him out of the overhead from now on!

CONSIDER CHAIN! It's a serious problem and one not to be tossed off lightly. Know what you are doing when you buy chain—for there IS a vast variance in chain quality.

Know that the chain you buy is exactly right for the job it is supposed to do. Know that the chain you use is NOT jeopardizing life and profit because it is unsuited to the purpose.

A Taylor engineer will be glad to help you solve these problems — as only a trained chain man *can* solve them. It will obligate you in no way to call in a Taylor chain man.

Just a postcard will bring him . . . . or a copy of Catalog "A", full of chain information. Drop it in the mail today!

S. G. TAYLOR CHAIN CO.
DEPT. B HAMMOND, IND.

Shots From the Firing Line — *Continued*

Colorado, in 1932, will have a total of $6,950,000 for highway improvement, **the largest amount ever spent in one year**, according to Governor Adam (at Denver, November 19th.) The Highway Department had more than $4,000,000 left over from 1931, while the revenue from the gasoline tax and from other sources will bring the fund to above figure, the Governor said.

Arizona Notes

The Arizona Highway Commission has issued an order that it will be necessary for all contractors bidding or contemplating bidding on road projects advertised by the Arizona Highway Department to be let after January 1, 1932, to submit a revised financial statement, corrected to the above date. It also will be necessary to revise these statements every three months thereafter if it is the intention of the contractor to bid on any job being let within that period. The financial statements must be checked and sworn to by a Certified Public Accountant.

On the Florence-Tucson Highway from Pima-Pinal County Line extending northwesterly approximately 22 miles to the overpass at Pichacho, **New Mexico Construction Company** of Albuquerque, New Mexico was low bidder with a total of $142,924.02. This job includes 35,111 cubic yards of excavation for roadway, drainage, structural and borrow; 29,688 cubic yards of subgrade stabilizer, 241,959 square yards preparation of subgrade or road surface; 37,328 miles formation and shaping of shoulders; 30,251 cubic yards of mineral aggregate; 22,500 cubic yards clearing and stripping mineral aggregate pits together with 227,138 gallons of Asp. oil for road surfaces and 329,224 gals. cut-back Asp. cement. Additional oil and aggregate are required for the overpass approaches and roadway which form a part of the contract.

Washington Notes

By W. A. DAFOE

The accompanying interesting picture shows a portion of the operations of **Elliott-Stroud Brothers & Seabrook** of Seattle and Los Angeles on the West Seattle Reservoir. This is the largest of its kind on the Pacific Coast. In the picture a Caterpillar 60 with an Ateco scraper and tamper is cutting down the last of the dirt ramp used as a roadway into the reservoir. Ahead of it a Caterpillar 30 with an Ateco scraper is picking up and removing some of this dirt to make other necessary fills. In the background is a Lorain which helped in dirt moving.

Halleran Brothers, Seattle contractors, have shipped their new 1¼-yard Bucyrus-Erie Diesel shovel to their job near Brownsville, Washington for constructing home to market road in Kitsap County. The 116,000 yards of excavation involved will be done with the two Bucyrus-Erie Diesel shovels owned by Halleran Brothers.

Roy M. Buck, of Bonners Ferry, Idaho, was awarded a contract for road construction near Yakima, Washington. A three-quarter yard Bucyrus-Erie Diesel shovel will han-

For your convenience in writing to S. G. Taylor Chain Co. you will find a card bound in this issue.

dle approximately 55,000 yards of excavation on this work.

Morrison-Knudsen Company was awarded the contract for grading and surfacing with crushed stone State Road Number Five near Enumclaw, Washington involving 190,000 yards of dirt and 33,000 yards of rock excavation. L. F. James of Tacoma, Washington will handle this excavation with his two Bucyrus-Erie Diesel machines carrying yard and yard and one-quarter dippers. They contemplate working throughout the winter expecting to complete the job in June, 1932.

The General Construction Company of Seattle recently announced the removal of their offices to 3840 Iowa Avenue, near the intersection of Iowa Avenue and Spokane Street.

Bids were received on December 30th by the Yakima office of the U. S. Bureau of Reclamation for construction of the Prosser power canal, power plant, and alterations to the Prosser diversion dam on the Yakima project. The work is located near Prosser, Washington. Included is diversion and care of river during construction, removal of part of old diversion works, 165,000 of all classes of excavation, 60,500 station cubic yards of overhead, 37,500 cubic yards of compacting embankments, 1,200 square yards of gravel blanket, 23,600 square yards of earth blanket, 6,000 cubic yards of backfill, 3,685 cubic yards of concrete, 370 cubic yards riprap, placing 210,000 pounds reinforcing bars, 656 linear feet of grout holes, and other items.

A contract in the amount of $38,131.84 was awarded to **C. J. Erickson** of Seattle, Washington for clearing, grading, draining and surfacing with crushed stone about 4.0 miles of State Road No. 5, Mossy Rock to Ajlune, Federal Aid Project No. 134-C, in Lewis County. This involves about 16 acres of clearing, 46,000 cubic yards of excavation, 16,190 cubic yards of crushed stone, 1,743 lineal feet of pipe and other items.

San Francisco and Vicinity

By H. L. LIVINGSTON

J. P. Holland's outfit is making a fast exodus from San Francisco for their job in San Bernardino County. This job will be one of the **best equipped construction jobs** in California as five shovels will be worked on a double-shift basis to move 650,000 yards. This equipment consists of two Bucyrus-Erie 37-B combination shovels and draglines, one Bucyrus-Erie Gas+Air 1¼ yard shovel and two Northwest draglines. In addition to this, four Caterpillar 60 tractors will be used and about twenty 5-yard trucks.

The City of Santa Monica will soon call for bids for the construction of a reinforced concrete crib-type breakwater. The overall dimensions or section of each crib will be about 33 ft. wide at ocean bottom, 23 ft. wide on top and about 41 ft. high. These cribs, of which there are two, will be divided in cells by longitudinal and cross walls. $690,000 is available for this work.

The Lewis Construction Company of Los Angeles are moving their 52-B Bucyrus-Erie dragline to their job near Elkhorn, California to move 300,000 yards on the Yolo by-pass. Operator Hopper, Heisler and Mason are operating this machine on a three-shift basis.

W. K. McMillan has just shipped his Gas+Air Bucyrus-Erie shovel, together with his trucks and tractors, back into San Francisco, having just finished up a tough rock job at Ely, Nevada in record time. Mr. McMillan states that his equipment gave a very excellent account of itself. Due to this performance, he was able to get out of Nevada just ahead of the first snow storms which otherwise would have prevented him from finishing his work before next spring. Operator Leo Stewart handled the levers of this shovel.

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HELP OF ALL KINDS FURNISHED FREE

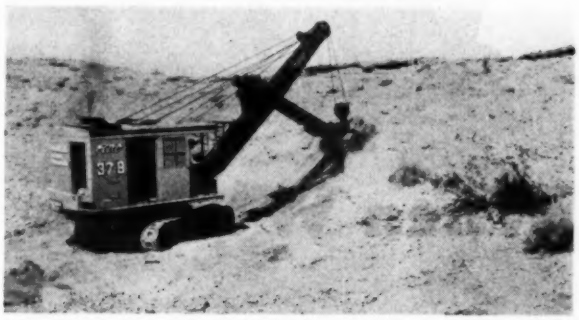
Considerable interest is being aroused among local highway contractors over bids which will be called for within the next few weeks for 11½ miles of grading in Placer County from Gold Run Airport. This job will have 803,000 cubic yards of road excavation.

Frederickson & Watson of Oakland, California have been awarded the contract by the California State Highway Commission for grading 6 miles of highway in Santa Barbara County involving some 360,000 yards of roadway excavation.

R. A. FARRAR

We regret to announce the death of R. A. Farrar on November 25. Mr. Farrar was a member of the construction firm of Granfield, Farrar & Carlin and was a pioneer contractor of San Francisco.

Los Angeles and Vicinity



Near Earp, California we came across this husky Bucyrus-Erie 37-B Diesel shovel at work. The machine is owned by the City of Los Angeles Department of Water and Power. R. E. Working is operator.

INTEREST PAYABLE — The use of a Hayward Bucket pays interest regularly in the form of lower excavating costs. Address The Hayward Co., 52-54 Church St., New York, N. Y.
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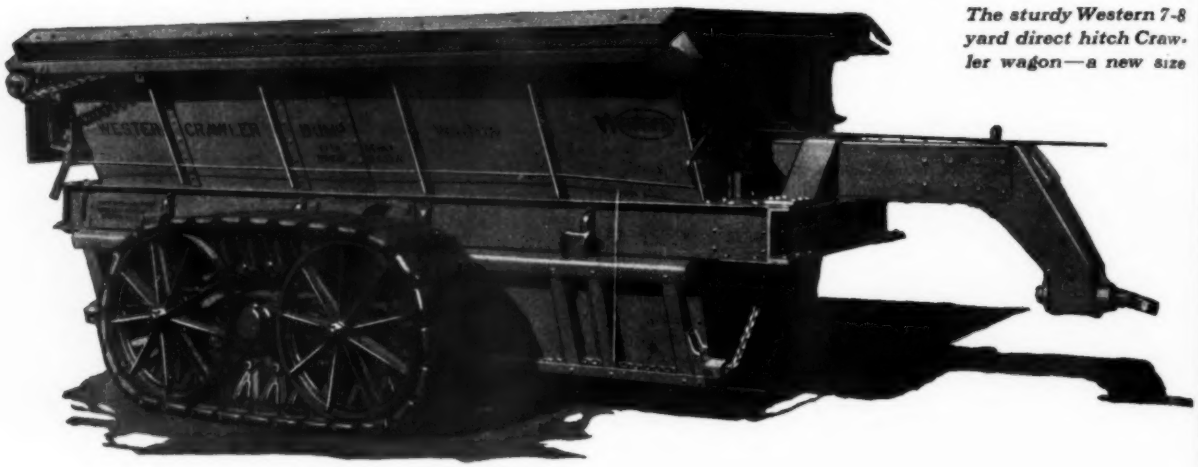

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Every Western Crawler wagon is equipped with the Spring Windup. With this device, the load may be

Western 7-yard Crawler Wagon with front truck.

WESTERN

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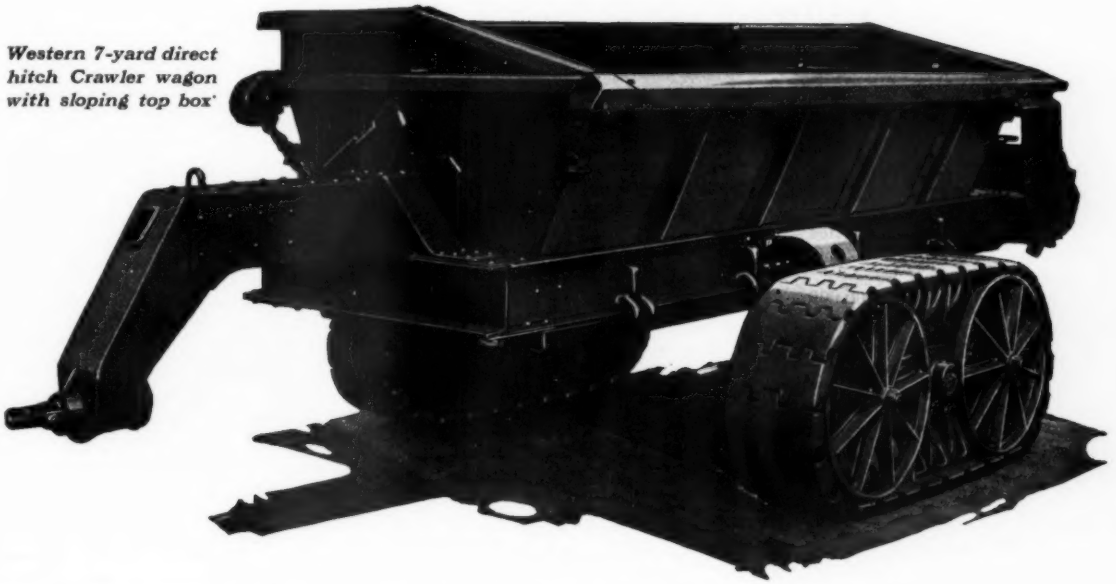
Western Crawler Dump Wagons



Western 7-yard direct hitch Crawler wagon with sloping top box

dumped and the doors closed either by the dump boss from the ground or by the tractor driver, eliminating the wagon man.

The new Western 7-8 yard direct hitch wagon and the Western 8-10 yard wagon with front truck make available two more Western wagons within the range of capacities that have been proved most economical. The entire line is described in Bulletins W-31HK and W-31JK. Where shall we send your copies?

The Spring Windup is an exclusive feature of Western Crawler Wagons.

Western Wheeled Scraper Company

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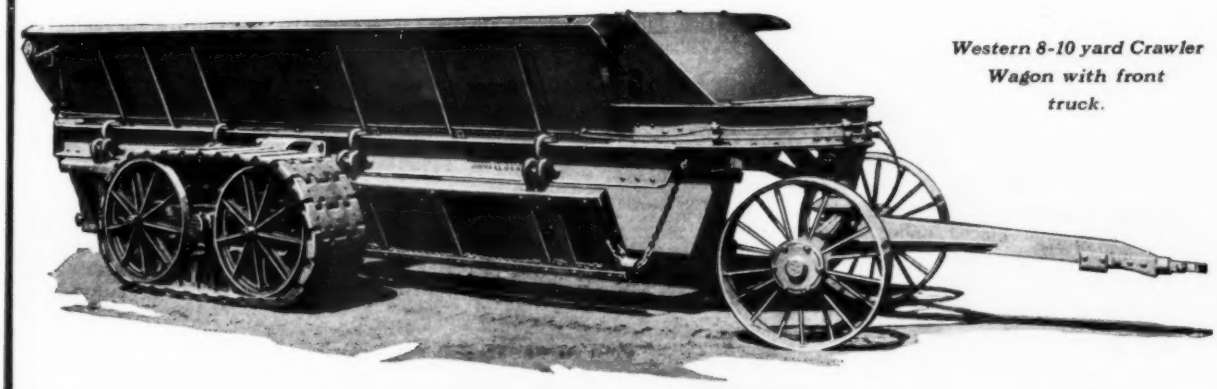

Western 8-10 yard Crawler Wagon with front truck.

WESTERN

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Excavation for 1932 Highway Construction

(Continued from Page 14)

Nevada (Continued)

Oiling
Gravel surface highway using a 65% to 70% road oil (road mix) -- 266 Miles
Estimated cost -- $ 682,000
Major Structures
Estimated cost --- $ 100,000

The program, as outlined above, compares very favorably with the program published in The Excavating Engineer covering 1931 work, but it may be materially increased if Congress should appropriate additional funds for an emergency loan and also an appropriation under the Colton-Oddie Act which is known as the "Federal Lands Fund." This year Nevada received approximately $1,000,000 from the emergency loan and $600,000 from the Federal Lands Fund. Naturally the forecast given a year ago did not include the construction the state was enabled to place under way due to the additional appropriations.

On the connection between West Virginia 24 and US 50 in Preston County, Pocahonta Construction Company of Rommey finds the sure control of this Bucyrus-Erie Gas+Air valuable in this shallow grading. The boys are holding a beautiful grade you'll notice though the going is plenty tough. Caterpillar Sixty and Athey wagons do the hauling.

During the past six weeks the following work was placed under construction:

55 Miles new Construction—estimated cost	$250,000
29 Miles reconstruction—estimated cost	88,000

All of this work will be carried over in 1932.

All work placed under way during the spring and summer of this year has been completed. It is estimated that approximately 30 per cent of the grading entailed in the aforementioned construction can be handled to advantage with power shovels.

New Hampshire

Reports for 1931 work have not been made by various engineers as to length and quantities as yet. Regarding 1932 work, no definite program has been laid out. Roads and Streets magazine estimates 92 miles of surface treated gravel at cost of $1,000,000, paving with concrete 20 miles at $1,000,000, bituminous macadam 5 miles at $100,000, and plain macadam for 8 miles at $275,000.

New Jersey

The tentative program of the State Highway Commission of New Jersey for 1932 construction includes 9.55 miles of new State highway to cost approximately $1,500,000 including bridges and viaducts. Items of reconstruction on existing highways are estimated as 65 miles of Federal Aid highway at $5,250,000; 27 miles of State highway at $10,000,000; 350 miles of county and local roads at $5,500,000; viaducts and bridges 8 miles at $12,725,000. Carried over on old contracts including both roadway and borrow excavation, New Jersey has approximately 1,555,000 cubic yards to move at cost of about $530,000. Paving for 1932 is estimated at 92 miles to cost $15,250,000. If this tentative program is approved and carried out it will represent a decrease in expenditure of about 10 percent from the 1931 schedule of highway construction.

New Mexico

Income now in sight for highways in New Mexico during 1932 will approximate $5,732,343. The sources of this income with estimated amounts, are as follows:

Federal Aid	$1,732,343
Highway Debenture	1,000,000
Gasoline Taxes	2,500,000
Motor Vehicle Fees	400,000
Property Taxes	100,000
Total	$5,732,343

One million dollars of this income will be required to pay principle and interest on outstanding debentures. This leaves $4,732,343 as the approximate magnitude of the construction and maintenance program including engineering and administration. In addition to this there will be expended by the Government approximately $427,000 of Forest funds on surveys, maintenance, and construction of Forest highways in New Mexico.

This program would be altered and increased should the Federal Government appropriate another advance emergency loan to the states for 1932 highway construction.

New York

The size of New York's program for the year 1932 is entirely dependent, of course, upon the amount appropriated by the Legislature, which convenes on or about January 1, 1932. Until such time, no information which could be used as a basis for making an estimate, is available.

The state of New York will probably complete around 970 miles of pavement in the year 1931. Also, it is very probable that the mileage for 1932 will not be as great as that for 1931 (one reason being that the allocation of Federal Aid funds for 1931 was considerably more than is expected for the year 1932) unless a change may be made in the State allocation.

A more complete forecast will be reported in an early issue.

North Carolina

E. M. Barton, Senior Office Engineer for the State Highway Commission of North Carolina, expects a 25 per cent decrease in expenditure for construction in his department for 1932. The

Here's a typical job of Texas highway building. J. E. Smith and Sons had 140,000 yards to move on this section of US 60 Texas 33 near Canadian. They used this Bucyrus-Erie 32-B shovel and an elevating grader loading to Stroud dump wagons.

Geo. M. Brewster & Son, Inc., of Bogota use Mack trucks and Bucyrus-Erie 43-B to speed the dirt moving on this New Jersey job.

forecast for North Carolina includes 475 miles of Federal Aid roads graded at an expenditure of $5,200,000; 100 miles of State roads (not Federal Aid) at an expenditure of $500,000; 100 miles of county and local roads at an expenditure of $200,000. In addition it is expected to reconstruct 75 miles of Federal Aid roads at a cost of $350,000. The new roads will probably involve approximately 7,000,000 cubic yards of excavation and reconstruction of about 150,000 cubic yards. It is expected that about 75 per cent of this work will be suitable for shovel operation. North Carolina is carrying over into 1932 150,000 cubic yards of excavation at an estimated cost of $60,000 on old contracts. This State is expected to pave 125 miles at a cost of $3,000,000 and to surface with gravel, crushed stone or top soil 525 miles at a cost of $2,300,000.

North Dakota

It is estimated that North Dakota will grade approximately 400 miles of new road at an expenditure of $1,320,000 and that the amount expended on county and local roads will be between $1,500,000 and $2,000,000. It is expected that reconstruction will be carried out on 50 miles at a cost of $165,000. The approximate cubic yards of excavation required for new roads construction will be approximately 4,500,000 cubic yards and on reconstruction 750,000 cubic yards. In addition there will be carried over on old contracts between 1,250,000 and 1,500,000 cubic yards cost ing approximately $250,000. About 100 miles of roads will be finished with oil mixed surfacing at cost of $400,000 and about 700 miles with gravel or crushed stone at a cost of approximately $900,000. The above program represents a decrease of between 25 and 33⅓%, the reduction being due to a reduction county and township work. However, another emergency appropriation may be provided by Congress which will increase North Dakota's work on Federal Aid highways materially.

Ohio

It is probable that during 1932 Ohio will build 420 miles of Federal Aid and State highways at an expenditure of approximately $1,500,000. Reconstruction is planned for 300 miles at an estimated cost of $300,000. It is estimated that the cubic yardage required for the new roads total 3,500,000 cubic yards and that on reconstruction 1,200,000 cubic yards. It is probable that 30 per cent of the total will be moved with power shovels. Ohio will probably pave 400 miles of highway at a cost of $10,000,000; surface 25 miles with gravel or crushed stone at a cost of $75,000; and resurface and widen 300 miles at a cost of $2,100,000. On the basis of this forecast expenditure for highway construction will show a 20 per cent decrease from last year.

Oklahoma

Letters and telegrams to the Oklahoma State Commission fail to bring any reply. We are therefore unable to publish at this time anything in the way of a forecast for Oklahoma highway construction.

Many records were broken on this job of George N. and O. J. Yoho on a West Virginia State Highway in Monongalia County. Athey and Caterpillar are hauling on this cut from a Bucyrus-Erie 43-B. On another section a Bucyrus-Erie steamer loads to International trucks.

Oregon

On account of uncertainty as to the amounts of funds that will be available for highway purposes in the State of Oregon, it is not possible to at this time forecast with any accuracy the amounts that will be expended during

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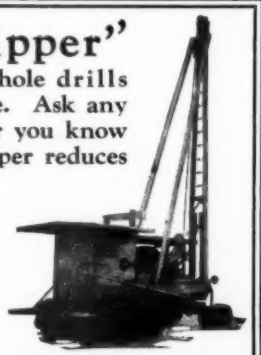

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1932 in the improvement of the State's highway system.

Of whatever amounts become available, approximately $3,350,000 will be required for the payment of interest and principal on bonds, $3,000,000 will be required for maintenance, $400,000 will be required for cooperation in the construction of forest highways, $1,000,000 will be required for emergency employment work, and $500,000 will be required for administration, surveys, rights-of-way, and miscellaneous. After these items of expense have been met, the amount remaining, which may be anywhere from $1,500,000 to $6,000,000, will be available for new construction work and betterment.

The construction and betterment program will not be formulated until it is known what special assistance, if any, is to be provided by the Federal Government as a means of alleviating the unemployment situation.

Pennsylvania

There is nothing definite on the program of the Department of Highways for 1932, and Samuel Eckels, Chief Engineer, reports that he is unable to say when information will be available. Our program will depend, to a large extent, upon the action of the Legislature now in session to consider unemployment relief. We expect to be able to report Pennsylvania's program for 1932 in a later issue.

Rhode Island

In forecasting the probable highway program of Rhode Island for 1932, G. H. Henderson, Chief Engineer, estimates that 23 miles of new roads will be graded at an expenditure of $200,000. Of this about 17 miles will be Federal Aid costing $185,000 and 6 miles will be on state roads and cost $15,000. It is also planned to reconstruct 16 miles of Federal Aid highways at a cost of $40,000. The yardage of excavation involved on the new road work will be some 650,000 cubic yards with an addition of 120,000 cubic yards for reconstruction. It is estimated that 90% of this work will be suitable for shovel excavation. Rhode Island is carrying over no uncompleted contracts into 1932. Mr. Henderson estimates that 39 miles of paving will be let during 1932 at a cost of $1,400,000. This program represents a decrease of approximately 20% from work carried on during 1931.

South Carolina

Charles H. Moorfield, State Highway Engineer, gives us the following excellent summary:

"The Fiscal Year ending September 30, 1931, stands out as the most active year in the history of road building in South Carolina. During the year contracts were awarded for additional construction work estimated to cost approximately $20,000,000.00. This represents approximately 500 miles of standard paving, 400 miles of bituminous surfacing, a number of miles of grading and earth type roads, and the necessary bridge work.

"During the year actual construction completed was 674 miles of standard paving, 220 miles of bituminous surfacing, and a number of miles of earth type roads and bridges. The actual expenditures for construction during this period was $24,029,478.40.

"The status of the State Highway System as of September 30th was as follows:

	Miles	Miles
Standard Paving completed	2,114.3	
Bituminous Surfacing completed	579.6	
Improved earth types completed	1,837.7	4,531.6
Standard Paving under contract	236.8	
Bituminous Surfacing under contract	351.9	
Earth types under contract	242.7	831.4
Unimproved	628.7	628.7
Total		5,991.7

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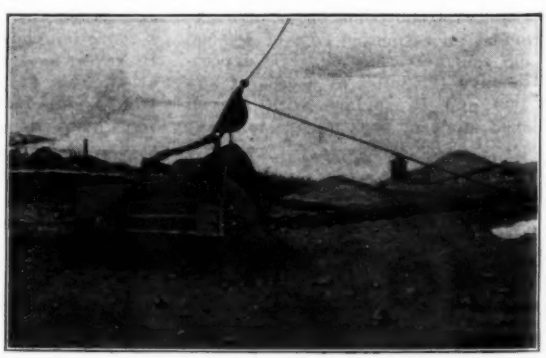

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"A definite construction program for the Fiscal Year ending September 30, 1932, is not available at this time. The 1929 Highway Bond Act, under which the Department is now operating, provides for the issuance of Bonds or Certificates of Indebtedness, not to exceed the sum of $65,000,000.00 or $20,000,000.00 in any one year. On September 30 only $25,000,000.00 had actually been realized from this source with the State asking for bids on an additional $10,000,000.00 on December 23d. This $25,000,000, together with Federal Aid and other funds, has enabled the Department to award contracts for approximately $38,000,000.00. Of the work covered by these contracts there remained uncompleted on September 30th approximately 237 miles of standard paving and 352 miles of bituminous surfacing. The unpaid balance on outstanding contracts was approximately $10,500,000.00.

"This uncompleted portion of active contracts as of September 30th constitutes, as far as I know at this time, the only definite program for the Fiscal Year beginning October 1, 1931, although it is hoped that the State will be able to sell additional bonds sufficient for the Department to undertake a program of approximately $20,000,000 including the uncompleted portion of active contracts, or additional contracts totaling approximately $9,500,000.00.

"The expenditures of the Department for maintenance during the Fiscal Year ending September 30, 1931, was $2,252,017.54."

South Dakota

South Dakota's revenue for highways is estimated for 1932 at $6,000,000. Of this, $2,500,000 will be required for maintenance and $3,500,000 is expected to be available for construction. Of course another Federal Emergency appropriation will change all quantities. However, on the basis of the expected revenue for construction of $3,500,000 South Dakota will probably grade 150 miles of new roads in Federal Aid classification at an expenditure of $600,000. Another $600,000 will be used for Federal Aid reconstruction on a second 150 miles. The additional excavation required for the new roads and reconstruction is approximately the same and runs about 15,000 cubic yards per mile. It is possible that about 40 miles will be paved with cement concrete at a cost of about $1,000,000 and gravel or crushed stone surfacing applied to some 200 miles at a cost of about $300,000. Oil treatment gravel will probably be applied to 300 miles and it is estimated that $1,000,000 will be used for this purpose.

Texas

An indication of the mileage, type, and cost per miles of construction contracted for during the calendar year 1931 follows:

Mileage	Type	Price + 10% Total Contract	Per Mile
1,431.764	Gr. and Sm. Dr. Structures	$ 6,695,966.34	$ 4,676.72
	Other Structures	$ 5,892,450.78	
880.496	Conc. Pvt. and Equiv. Types	$17,536,929.86	$19,917.10
683.342	Flexible Pavements	$ 4,058,382.44	$ 5,939.02
2,995.602	Totals	$34,183,729.42	

It is anticipated that construction contracted during the calendar year 1932 will show an approximate reduction of ten per cent from that for 1931.

As we go to press a budget has not been prepared for 1932, and it is impossible to subdivide proposed expenditures into the various types of construction that come under the jurisdiction of the State Highway Department.

Tennessee

The General Assembly for 1931 did not provide any additional highway funds and, as a result, construction and maintenance has been limited to exist-

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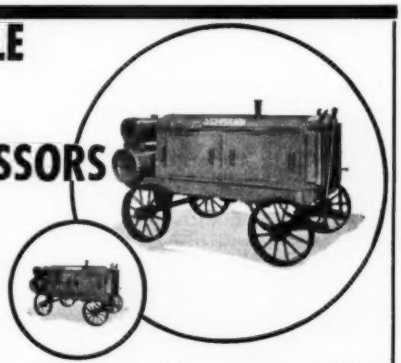

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ing revenues. This procedure will continue through 1932.

It is estimated that the Department of Highways and Public Works will have approximately $2,500,000 to be used for the purpose of matching Federal Aid and carrying on other State construction. Office Engineer Jno. L. Neely, Jr. believes that Tennessee next year will have a small program of approximately four or five million dollars, but at this time he is unable to submit a statement as to the miles of each type of construction. According to Mr. Neely it will, however, be largely limited to the improvement of uncompleted sections in existing highways.

Utah

H. S. Kerr, Chief Engineer of the State Highway Department of Utah advises that they expect to grade 100 miles of new roads at an expenditure of $600,000 during 1932. This includes 80 miles of Federal Aid highway with an expenditure of $500,000 and 20 miles of State highway with an expenditure of $100,000. It is also planned to reconstruct 20 miles of old roads at an expenditure of $150,000, and of this, 15 miles costing $100,000 will be Federal Aid, and 5 miles costing $50,000 state roads. Mr. Kerr estimates that the probable cubic yardage of excavation involved on the construction of new roads will be 1,000,000 cubic yards and on reconstruction 200,000 cubic yards. About 40% of this total yardage will be suitable for shovel operation. In addition there is carried over on old contracts about 200,000 cubic yards which will cost approximately $50,000. Mr. Kerr's estimate of surfacing operations places the paving at 5 miles with an estimated cost of $150,000, surfacing with gravel or crushed stone or oil processed gravel at 380 miles with an approximate cost of $1,100,000. The program as given totals $2,050,000 and with the addition of bridges, etc. will bring total construction costs to $2,500,000. Maintenance and miscellaneous items will amount to approximately $1,500,000 making a total expenditure for the State Highway Department $4,000,000. It is estimated that the expenditure for the total of 1932 road program will show a decrease of 20% from that of 1931.

Vermont

The highway and bridge program for the State of Vermont will not be definitely determined until after the first of January 1932. However, there is no question but what the amount of available money will be at least $480,000.00 less than in 1931, this reduction being from the Government Federal Aid funds. On the basis of this reduction in finances we would estimate that the program will include one hundred miles of reconstructed State highways costing approximately $2,200,000.00. The State Aid and town road construction will probably equal that of the past season. No estimate is possible at this time regarding the type of surface that will be built on the estimated one hundred miles of State highways.

Excavation will probably run to approximately 700,000 cubic yards, about 80% of which will be shovel work.

Virginia

The State Highway Commission announces tentative 1932 allocations of $12,423,040 highway funds, from which are deducted $1,623,000 for overhead, engineering, surveys and plans, and $1,000,000 placed in the highway gap closing fund, leaving a balance of $10,800,000 for allocation to the eight construction districts. Allocations are subject to changes. More than half the $1,000,000 gap fund will be expended on the Valley Turnpike, route 33. Of the total, $525,000 was allocated to work north of Staunton and $150,000 for work between Natural Bridge and Fancy Hill. Of the remainder, Salem district will get $150,000 for route 17, between Fincastle and Clifton Forge, and Culpeper district $150,000 for route 28, from Charlottesville north, and $25,000 for the same route from Amherst north.

The total of $12,423,040 allocated at this time compares with $11,591,463 allocated a year ago and $12,818,260 allocated late in 1929. Estimates of funds expected to be available will be derived from the following sources: motor vehicle fuel tax, $7,500,000; convict labor, $555,000; Federal Aid, $1,992,380; title fees, overhead, etc., $2,380,660. From the total, $1,000,000 will be deducted for the gap fund; $330,660 for overhead, engineering and contingencies, and $292,380 for surveys and plans.

Washington

Samuel J. Humes, Director of Highways for the State of Washington, estimates that his state in 1932 will grade approximately 260 miles of new highways and reconstruction at an expenditure of $6,000,000. This will be divided with $2,800,000 on 100 miles of Federal Aid highways and $3,200,000 on 160 miles on State roads. This work will involve approximately 8,000,000 cubic yards of excavation, 80% of which is suitable for shovel work. In addition there is carried over on previous contractors 2,700,000 cubic yards of excavation at an estimated cost of $1,500,000. Mr. Humes expects the Department of Highways to pave 90 miles during 1932 at a cost of $3,000,000. It is probable that 190 miles will be surfaced with gravel or crushed stone at a cost of $950,000. This program involves an increase of 8% over the expenditures for 1931.

West Virginia

The 1932 program for grading of new roads in West Virginia involves a mileage of 228.8 and an expenditure of $4,195,000. About 50.4 miles of this is Federal Aid at an estimated expenditure of $989,000 while 178.4 miles is on State roads and will involve an expenditure of $3,246,000. It is expected that 52.6 miles of highway will be reconstructed, 23 miles of this being Federal Aid to cost $280,000 and 29.6 State highways to cost $115,000. It is impossible to estimate the amount that will be spent for county and local roads. The work on new roads will involve approximately 4,576,000 cubic yards of excavation and that on reconstruction 900,000 cubic yards. West Virginia is a rugged country and 95% of the excavation will be suitable for shovel operation. In addition to the above 2,600,000 cubic yards of excavation are carried over from 1931 contracts and involve a total cost of approximately $1,000,000. West Virginia expects to pave 40 miles of highway during 1932 at a cost of $800,000 and to surface with gravel or crushed stone 20 miles at a cost of $200,000. The above program involves a decrease of 40% from the total expenditure for construction carried on during 1931.

On this P. J. Knickenberg Company job on New York's Liberty Highway let under the Federal Aid Emergency Relief Act. Bucyrus-Erie ¾ yard gas and Marion 1¼ yard gas-electric team up to set the 75-foot, twenty-ton steel girders for this bridge. A story on Mr. Knickenberg's operations will appear in an early issue.

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L-11

LOADMASTER

For your convenience in writing to Bucyrus-Erie Company you will find a card bound in this issue.

Wisconsin

M. W. Torkelson, Acting State Highway Engineer of The Wisconsin Highway Commission, advises that it is extremely difficult to make an accurate estimate at this period for 1932 highway work for several reasons. In the first place, states Mr. Torkelson, the commission has not received complete information regarding the action by the county boards in their annual November meetings and in the second place plans are never far enough along at this period to give out accurate estimates, especially regarding miles and

Cutting straight across this beautifully rolling Wisconsin country between Merrill and Stevens Point this paving on US 51 speeds the motorist safely, economically and comfortably on his way.

cubic yards of earth excavation. However, the following tentative program will probably be of interest to our readers.

As we go to press it is estimated that 800 miles of new highways will be built in Wisconsin during 1932 at a total expenditures of $10,600,000 including surfacing. Of this amount $6,500,000 is for 250 miles of Federal Aid highways, $3,100,000 covers 200 miles of State highways and $1,000,000 represents the building of approximately 350 miles of county and local roads. Federal Aid reconstruction, widening, etc. will be carried on on approximately 60 miles at an approximate cost of $1,200,000, the same item on State roads will probably total 30 miles at a cost of $600,000 and on local roads 50 miles at $800,000. Mr. Torkelson estimates that the work on new roads will involve 4,500,000 cubic yards of excavation and on reconstruction 200,000 cubic yards. It is estimated that approximately 65% of this will be suitable for shovel work. In addition there is carried over 100,000 cubic yards at an estimated cost of $25,000. Mr. Torkelson expects that Wisconsin will pave 310 miles of highways during 1932 at a cost of $7,750,000 and will surface with gravel or crushed stone 220 miles at a cost of $1,210,000. In conclusion Mr. Torkelson says:

"Up to the present writing the Commission has approved contracts and day labor permits during the present calendar year for the construction of something over 1600 miles of highway improvements, at a total cost of something over $18,000,000. This program included nearly $2,000,000 of emergency Federal Aid, which was advanced early in 1931 for the purpose of assisting the unemployment situation. At the time this money was advanced by the Federal department, it was understood that it should be deducted from federal aid becoming available within the next five years, 20% being taken out of each year's allotment. Whether the present Congress will insist on this deduction this year, or whether it will allot even more emergency federal aid is a question on which we have had no advance information. It is our opinion, however, that while the types of construction may vary, the program in 1932 for Wisconsin will be about equal to that of 1931, as far, at least, as expenditures are concerned."

Wyoming

Z. E. Sevison, State Highway Superintendent, estimates that Wyoming will grade 147 miles of Federal Aid highways at an expenditure of $611,670 during 1932. In addition 86 miles of Federal Aid highways will be reconstructed at an estimated expenditure of $387,427. Work on the new roads will probably involve 2,500,000 cubic yards of excavation and the reconstruction an additional 1,000,000 cubic yards. Probably one half of this total yardage will be suitable for shovel operation. In addition to the above Mr. Sevison advises that 300,000 cubic yards of excavation are carried over on old contracts, and is estimated to cost $72,000. Oiling 525 miles of highways is expected to cost $1,600,000 and surfacing with gravel or crushed stone will probably be carried out on 512 miles at a cost of $1,780,000. No paving is proposed for 1932. The above forecast involves a decrease of about 25% from the program carried out in 1931.

CANADA

Alberta

Until such time as the Legislature for this province has met and voted the necessary money for carrying on the road programme, it is impossible to give information in regard to the program for road work during the season of 1932.

British Columbia

Program for the coming year has not yet been formed.

New Brunswick

B. H. Kinghorn, Chief Highway Engineer, in reply to our inquiry for a highway forecast says: "It is not consistent with the policy of the Highway Department to give advance information of this nature."

Nova Scotia

The Department of Highways has no information as yet as to what work will be carried out during the year 1932 and it is impossible to forecast this.

Saskatchewan

It is quite impossible to give any forecast for the 1932 program at this time. The program for 1932 will be submitted to the Legislature at the forthcoming session some time in January. The Legislature will be asked to vote funds for the carrying out of the program, but the Department of Highways is not in a position to forecast this program until such time as it has been thus dealt with by the Legislature.

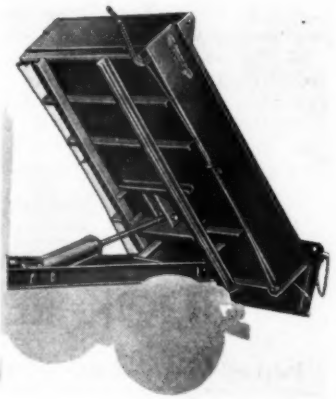
As reported by H. S. Carpenter, Deputy Minister, Saskatchewan's program of highway construction for 1931, was completed early in November. The total appropriation provided by the Legislature for all services other than administration was $4,889,720. As the season of 1931 advanced, however, the government decided that a very large additional program of work would be undertaken by the Department for the purpose of providing relief road work for residents of the province who otherwise would suffer during the current winter as a result of partial or total crop failure in certain sections of the southern part of the province, with the result that final expenditures on all services totaled $7,633,000. These are divided:

(a) Earth construction	$2,700,000
(b) Gravel surfacing	620,000
(c) Maintenance	700,000
(d) Colonization roads and secondary highways	317,000
(e) Sundry services	270,000
(f) Main market roads	620,000
(g) Bridges	316,000
(h) Ferries	140,000
(i) Relief grants to rural municipalities	1,950,000
Total	$7,633,000

Subcontractor E. M. Everly of Smith Field, Pennsylvania used his Keystone to drill for blasting through soapstone that kept this fill from standing up on West Virginia 73.

(Continued from Page 30)

signed to save the chassis, transmission, differential, clutch, axles and universal joints, which are placed under severe abuse when the truck is rocked with the body in tipped position in an attempt to dislodge sticky loads.



Also will be shown same type and the new slant type pipeless hydraulic hoists for one and 1½ ton chassis. The latter is a heavy duty hoist, in which is used a 6″ cylinder and it will handle continually all that the chassis itself will stand. The hoists pushes directly against the load, raising the body to a 55° angle.

The Anthony Company also have developed and will show heavy duty Pipeless Hydraulic Hoists for 2, 2½, 3 and 3½ ton trucks. In their heavy duty line is embodied the pipeless features, which has gained widespread recognition.

Many other features have been added to the Anthony line, such as heavier and stronger bodies, new type double acting tailgate, etc.

In attendance will be W. C. Anthony, President; R. R. Howard, Vice-Pres. and Sales Manager; J. H. Monning, C. H. Worrells, E. L. Flanigan and C. H. Montelius. *Anthony Company, Inc.*, is located at Streator, Illinois.

"My goodness," exclaimed the stranger who had dropped into the police court, "they've caught a pretty tough lot this morning, haven't they?"

"You're looking at the wrong lot," said his neighbor, "Those aren't the prisoners. They're the lawyers!"

POSITIONS WANTED

Space under this heading is available at $5.50 per inch or fraction thereof.

Address all box numbers c/o The Excavating Engineer at South Milwaukee, Wisconsin

DRAGLINE-CRANE-SHOVEL OPERATOR

Have operated electric, Diesel, steam, gasoline and Gas+Air machines on all types of excavation, irrigation and construction work. Willing to go anywhere on any make machine. Can do own repair work and furnish A-1 references. Single. Present location, Illinois. Box 3001.

DRAGLINE-SHOVEL OPERATOR

Experienced on Diesel, gasoline and steam machines on highway and drainage operations. Prefer operating a Diesel machine anywhere. Can do own repair work. Married. A-1 references. Present location, Ohio. Box 3005

DRAGLINE AND SHOVEL OPERATOR

Sixteen years' experience as shovel operator. Married, 36 years of age. Have operated practically all makes of machines, and have 10 years' experience as dragline operator. Can handle steam, Diesel, electric or gasoline machine. Have worked on highway and railroad grading, rock excavation in quarry, drainage and irrigation and dredging and also gold dredging. Prefer position on Bucyrus-Erie Diesel, E-2, D-2 or 50-B or other Bucyrus-Erie machines. Capable of taking charge of repairing and erecting and can handle crews. Best of references and can do own repairing. At present located in California but will go anywhere. Box 3007.

SHOVEL OPERATOR

27 years' experience on shovels throughout North America and Central America. Willing to accept any reasonable offer. Can do own repair work and furnish A-1 government and private recommendations. Present location, Ohio. Box 2007.

DRAGLINE-CLAMSHELL-SHOVEL OPERATOR

10 years' experience on Bucyrus-Erie gasoline machines on highway grading and materials handling. Willing to go anywhere in U. S. A. Married. Can do own repair work and furnish A-1 references. Present location, Illinois. Box 1901.

DREDGE ENGINEER-SHOVEL OPERATOR

20 years' experience on all types of excavating, drainage, stripping and pit work. Will go anywhere in U. S. A. Excellent repairman. Can furnish reliable references. Married. Present location, Indiana. Box 1902.

SHOVEL OPERATOR

Experienced on Diesel shovels on general highway work and on logging railroads. Single. Can do own repair work. Willing to go anywhere in U. S. A. Present location State of Washington. Box 2008.

DRAGLINE-CRANE-SHOVEL OPERATOR

12 years' experience on steam, gas+air, and gasoline shovels, draglines and cranes. Can handle own repairs. Experienced all kinds grading, basement excavation, sewer trenching, etc. Single. Will go anywhere in U. S. A. or Foreign. Good References. Box 2105.

SHOVEL OPERATOR

Fully experienced on Bucyrus-Erie, Lorain, Osgood and Northwest steam and gas shovels. Willing to go anywhere in U. S. A. at once on any kind of construction work. Reliable references furnished. Present location, West Virginia. Box 2104

DRAGLINE-CLAMSHELL-SHOVEL OPERATOR

22 years' experience on Gas+Air, gasoline and steam machines on highway, coal stripping operations, irrigation work, pile driving and many other miscellaneous jobs. Will go any place in U.S.A. Can handle own repair work. Married. Can furnish excellent references. Present location, New York state. Box 3004.

DRAGLINE-SHOVEL OPERATOR

Have operated large electric and steam stripping machines on coal stripping operations. Also experienced on construction work. Prefer operating electric stripper anywhere. Can do own repair work. Married. Reliable references furnished. Present location, Illinois. Box 3002.

DRAGLINE-CRANE-CLAMSHELL OPERATOR

13 years' experience on Diesel, Gas+Air, gasoline and steam machines on highway, quarry and construction work. Will accept operating work anywhere. Can handle own repair work and furnish best of references. Married. Present location, Maryland. Box 3003.

DRAGLINE-CRANE-SHOVEL OPERATOR

Experience covers 15 years on highway grading, coal mine and quarry pit wsrk. Willing to go anywhere in U. S. A. Married. Can do own repair work and furnish excellent references. Present location, Iowa. Box 2001.

SHOVEL OPERATOR

Fully experienced on Gas+Air, gasoline, and steam machines on general all around grading and excavating. Would go anywhere in U. S. A. Married. Can handle own repair work. A-1 references. Present location in West Virginia. Box 2002.

DRAGLINE-CLAMSHELL-SHOVEL OPERATOR

Twenty years' experience on Diesel, gasoline, and steam machines on highway and railroad grading and on levee work. Willing to go anywhere in U. S. A. Married. Own repairman. Reliable references. Present location, Indiana. Box 2003.

DRAGLINE-CRANE-SHOVEL OPERATOR

13 years' experience on Bucyrus-Erie Gas+Air, electric, gasoline and steam machines on all types of excavating. Willing to go anywhere in U. S. A. Married. Can do own repairing. A-1 references. Present location, Indiana. Box 2004.

DRAGLINE-CRANE-SHOVEL OPERATOR

22 years' experience on Gas+Air, steam, gasoline, electric and Diesel machines on levee, drainage, highway and general excavating. Will go anywhere. Capable of handling all repair work. First class references. Present location, New York. Box 2005.

DRAGLINE-SHOVEL OPERATOR

Have operated Bucyrus-Erie 50-B, 41-B, 20-B and 30-B machines on highway and railroad grading, rock excavation and drainage work. First class repairman. A-1 references. Will go anywhere. Located in Vermont. Box 3006.

DRAGLINE OPERATOR

11 years' experience on steam and Diesel machines. Excellent repair man. Would prefer operating a Bucyrus-Erie 50-B anywhere. Can furnish reliable references. Present location, New York. Box 2101

TRADE NOTES

Robert H. Morse, formerly Vice Chairman of the Board of Directors, has been elected to the position of President and General Manager of **Fairbanks, Morse and Company** to succeed W. A. Hovey on his resignation, December first. Mr. Morse issued this statement: "The Company has a history of successful operation over a period of a hundred years and we look forward with confidence to its continued success. Our plans for the future are based on the possibility that there will not be an immediate general upturn in business and we are prepared to meet that kind of a market."

The Wellman Engineering Company of Cleveland, Ohio, announces the purchase of the clamshell bucket and heavy-duty trailer business of the G. H. Williams Company of Erie, Pa. The two lines will continue to be marketed under their well-known trade names "Williams Bucket" and "Williams Trailer."

The G. H. Williams Company, in business for some thirty years, are one of the oldest builders of the clamshell type of material handling buckets and were the originators of the power-arm type. The Williams line is complete from light bucket for fastest rehandling to the massive ore, dredging, and clean-up types, for one-line, two-line, three-line, four-line and hook-on operation, and for every kind of hoisting equipment.

The Williams heavy-duty "Arch Girder" type of Trailer, built in capacities from 5 tons to 60 tons and larger, in 6-wheel, 8-wheel, 10-wheel and 12-wheel types, for use in transporting contractors' and other types of heavy equipment, has met with marked success, and it is reported their production has doubled during the present year.

The "Williams Bucket" makes an important addition to the type heretofore built by The Wellman Company, placing them in a position to furnish buckets for any class of work. The engineering, manufacture and sale of the Williams line will be immediately transferred to The Wellman Engineering Company plant in Cleveland.

W. C. Swalley, Secretary and General Manager; A. J. Lichtinger, Assistant Manager; C. F. Weiblen, Sales Manager; and P. T. Robin, Chief Engineer of the G. H. Williams Company at Erie, will be associated with The Wellman Engineering Company at Cleveland in the manufacture and sale of this equipment.

The magazine **Oil Engine Power** has changed its name to **Diesel Power** and is now located at 192 Lexington Avenue, New York.

BOOK REVIEWS

Ingersoll-Rand Company, 11 Broadway, New York, has issued a new 20-page, illustrated catalogue, Form No. 4364, on paving breakers and pile drivers for sheet piling. It describes four sizes of paving breakers, two of which, the 37-pound L-54 and the 80-pound R-63, have been added to the line in recent months. It also contains material on two new pile drivers, the R-63 and the R-30.

Recently issued by **General Electric Company**, Schenectady, is a four page folder entitled "Flood Lights for Outdoor Construction."

FOR SALE

Space under this heading is available at the following rates, payable in advance of publication:

1 to 3 inches	$5.50 an inch net
Over 3 to 7 inches	5.25 an inch net
Over 7 inches	5.00 an inch net

An inch is measured vertically on one column—three columns to a page. Any space may be used measured by the even inch in height and by one, two or three columns in width.

The price per inch is based on total space used—multiply ad. space by number of continuous insertions.

Address all box numbers c/o The Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels

Under 2 yards

USED TYPE "O" THEW STEAM SHOVEL, shop number about 2100; 20′ boom, 16′ dipper handle, ¾-yd. dipper. Good running condition. Located Milwaukee vicinity. Bargain. Box 261-SS.

REBUILT GA-2 ERIE SHOVEL mounted on new single shaft caterpillar, 1¼-cubic-yard inserted tooth dipper, 22-foot 6-inch boom, 16-foot dipper handle, starter. Carries guarantee of new machine. Box 43-SS.

NORTHWEST SHOVEL, model 105, caterpillar mounted. 24-foot boom, 1-cubic-yard dipper, 16-foot dipper handle. In good condition. Price $4,500, f. o. b. Utica, New York. Box 34-SS.

TYPE "B" ERIE STEAM SHOVEL, caterpillar mounted equipped with 21-foot 3-inch boom, 18-foot 6-inch dipper handle, power boom hoist, ¾-cubic-yard dipper; in excellent condition; just installed $400 worth of repairs. Located vicinity Kansas City. Box 80-SS.

ERIE TYPE "GA-2" GAS+AIR SHOVEL, shop number 4117, mounted on spur gear drive caterpillar trucks, and equipped with a 24-foot boom; 18-foot, 4-inch dipper handle; 1-cubic-yard manganese cast front socket inserted tooth dipper; power boom hoist; air self-starter, and all equipment and appurtenances in accordance with the specifications of the Bucyrus-Erie Company, f.o.b. cars shipping point Virginia. Box 126-SS.

USED 30-B DIESEL SHOVEL—25′9″ Boom, 14′ Dipper Handle, including Dragline Equipment. Box 251-SS.

MARION TYPE 32 FULL REVOLVING STEAM SHOVEL, shop number 4639, mounted on four belt caterpillar type mounting and equipped with standard boom and dipper handle and 1¼-cubic-yard dipper. Shipping point western Virginia.

This machine should be an excellent purchase at the price offered, for quarry or slag bank operation. Box 212-SS.

INSLEY ½-CUBIC-YARD SHOVEL, full-revolving. Shop number about R-200 (2 years old). Machine in excellent condition. Has had best of care. Located in Wisconsin. Box 238-SS.

20-B BUCYRUS STEAM SHOVEL, serial number 4000; caterpillar mounted; 18-foot boom, 12-foot 6-inch dipper handle, 1-yard dipper; shipped new in 1923; located western Missouri. Bargain. Box 241-SS.

TYPE "B" ERIE STEAM SHOVEL, caterpillar mounted, equipped with 21-foot boom, 18-foot dipper handle, boom hoist, ¾-cubic-yard dipper; sold new 1924; just completely overhauled; priced reasonably at $1,400. Located vicinity of Chicago. Box 41-SS.

MARION MODEL 37 ELECTRIC SHOVEL suitable for 3-phase, 60-cycle, 440 volts, equipped with 32-foot boom, 22-foot handles, and 1¼-cubic-yard dipper, on caterpillar mounting. Machine in very good condition. Located near Pittsburg, Kansas. Price reasonable. Box 90-SS.

BUCYRUS-ERIE TYPE D-2 DIESEL DRAGLINE, shop number 5055, 45-foot boom and 1-cubic-yard Page Class "M" drag bucket. Located Eastern Missouri. Priced to sell. Box 166-SS.

USED BUCYRUS TYPE 18-B ⅞-yd. steam shovel mounted on traction wheels. Located Southern Wisconsin. Bargain. Box 259-SS.

MARION MODEL 32, shop No. 5459, mounted on "cats," steam-powered, 1¼-cubic-yard dipper, 24-foot boom, 17-foot 6-inch dipper handles. Box 82-SS.

BUCYRUS-ERIE B-2 HIGH LIFT SHOVEL. Shop number above 10,000. New style "Cats." Cab armored two sides and rear. Roof reinforced. Has been thoroughly reconditioned. Located vicinity Louisville, Kentucky. Price f. o. b. cars present location $7500.00. Box 223-SS.

ONE 18-B BUCYRUS, ⅞-yard dipper on full revolving caterpillars. Box 182-SS.

MARION STEAM SHOVEL, MODEL No. 21, high lift boom, and forward drum, boiler just retubed, location near Baltimore, in excellent condition. Price $3,800.00. Address Box 267-SS.

FOR SALE

BUCYRUS 20-B ¾-cubic-yard shovel. Number 9868. High lift boom, one thousand feet electric cable, electric parts are fool-proof, have never made trouble. All in good condition. South Texas Location, price $5,000.00. Box 295-SS.

ERIE TYPE-B high lift steam shovel rebuilt July 1931 including new boiler. Since used 4 months. Excellent condition. Will rent. Box 285-SS.

ERIE TYPE B-2 high lift steam shovel, "Cat" mounted. Good operating condition. Will rent. Priced to sell. Box 286-SS.

ERIE-GAS+AIR 1¼-cubic-yard shovel rebuilt in August on new style "cats." Used three months. Will rent. Box 287-SS.

WHY YOU SAVE MONEY WITH LAY-SET

Internal stress in ordinary (non-preformed) wire rope literally eats up your money. Ordinary wire rope is like a bundle of springs—114 of them in a 6 x 19 wire rope. Each one of these 114 wires is held in place by force—resulting in a tremendous internal stress.

No wonder a firm seizing is necessary to confine this stress. No wonder the individual wires break prematurely from fatigue.

Now consider Lay-Set Preformed Wire Rope. Strands and wires lie normally in position. Wires and strands are free to do an equal share of their work. They wear down to a feather edge before breaking. There is no premature breaking of individual wires due to fatigue.

30% to 300% increased service is the result.

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Wilkes-Barre, Pennsylvania

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Address_____ MAIL TODAY

Company_____

(Write on margin type of service)

EVERY WIRE ROPE USER SHOULD READ THIS BOOK

There are 12 leading reasons why you save money with Lay-Set Preformed Wire Rope . . . 12 easily understood facts about Lay-Set that you should know before you order another foot of wire rope.

This is the beginning of a new year. Scan your wire rope bills of 1931. Figure how much 30% to 300% increased wire rope service means to you in dollars and cents . . . plus the saving in fewer recabling jobs. Now is the time to plan for better wire rope efficiency.

Send for our new booklet, "12 Reasons Why You Save Money With Lay-Set Preformed Wire Rope." It explains in a non-technical manner, why the elimination of internal stress results in 30% to 300% increased service, depending upon the type of your equipment and nature of the wire rope service.

Attached to the booklet, you will receive a sample length of Lay-Set Preformed Wire Rope—so you can . . .

MAKE THIS TEST ●

Unwind a strand as shown in the illustration to the right. Note the perfect helical shape to which the strand and wires in the strands are set.

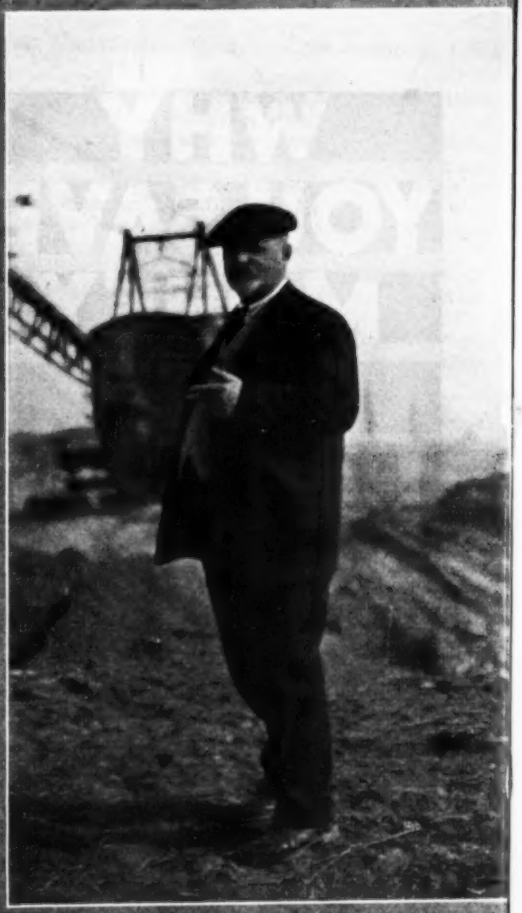
Then reverse the strand end for end and put it back into the rope. You won't be able to tell which strand was removed.

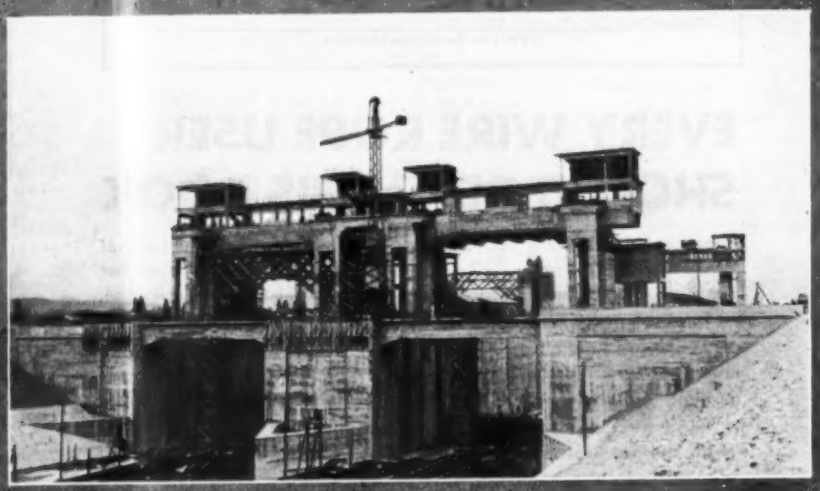
The coupon at the top of this page is for your convenience—mail it to us today for your copy of "12 Reasons Why You Save Money With Lay-Set Preformed Wire Rope." If you prefer, write us in full. Tell us the type of your equipment. Our engineering staff is at your service to help you save wire rope money. Write or wire today.

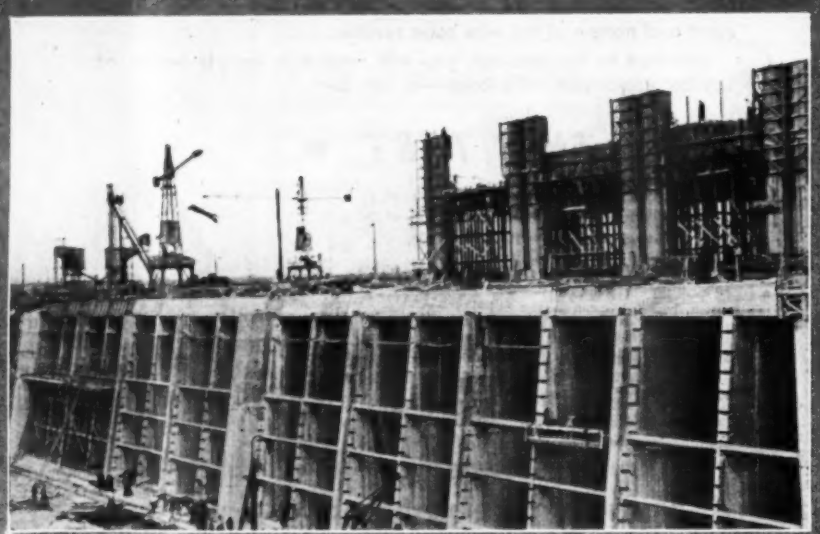
REDUCE YOUR WIRE ROPE EXPENSE BY 10% TO 70%

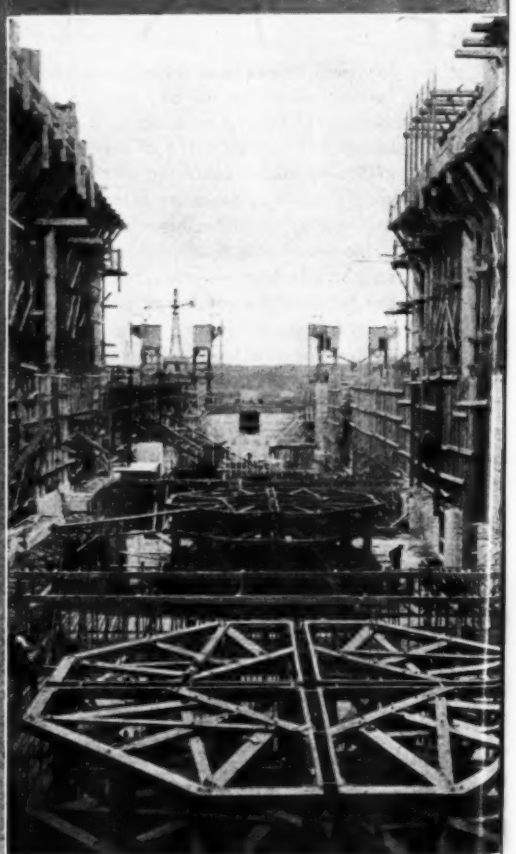
HAZARD LAY-SET PREFORMED WIRE ROPE

For your convenience in writing to Hazard Wire Rope Co. please use coupon or card bound in this issue.









CONSTRUCTION VIEWS FROM GREAT FRENCH PROJECT UNDERWAY ON THE RHINE

Above: Barrage from upstream. Below: Locks as seen from down stream with the start of erection at the right. Center: Power station as seen from upstream. Upper right: Chief Engineer Charles Moreau under whose able direction the construction has progressed well in advance of schedule. Lower right: Inside view of the power station erection.